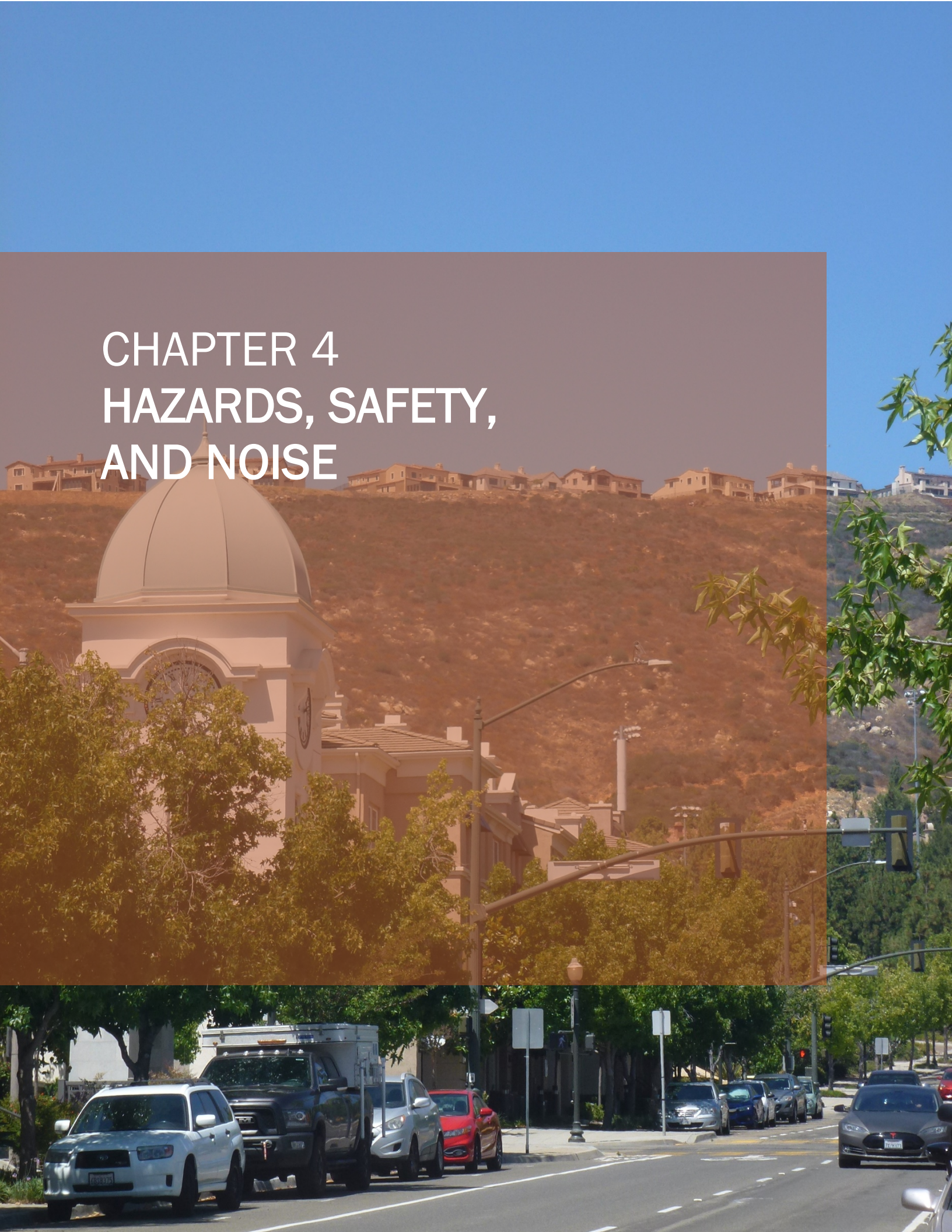


CHAPTER 4
HAZARDS, SAFETY, AND NOISE

4 HAZARDS, SAFETY, AND NOISE

Issues and topics related to hazards, safety, and noise within the Planning Area are addressed in this chapter. Some of the hazards addressed may be naturally induced, such as wildfire hazards. Other health and safety hazards may be the result of natural hazards which are exacerbated by human activity, such as development in areas prone to flooding. Additional hazards are entirely human-made, including airport crash hazards and exposure to hazardous materials.

This chapter includes descriptions of the characteristics of sound and noise and a description of transportation, stationary, and construction noise sources within the Planning Area. A description of the noise monitoring survey results, tabularized noise exposure contours, and an existing conditions noise contour map that reflects traffic and stationary noise sources are included. This section also summarizes current information on ground vibration thresholds and summarizes the existing vibration environment.

Note that seismic hazards are discussed in Section 5.0 (Conservation and Natural Resources) under Geology, Soils, and Seismicity. This chapter includes the following sections:

- 4.1 Hazardous Materials and Waste
- 4.2 Air Traffic
- 4.3 Fire Hazards
- 4.4 Flooding
- 4.5 Climate Change and Resiliency Planning
- 4.6 Wildlife Hazards
- 4.7 Noise

4.1 HAZARDOUS MATERIALS AND WASTE

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that have been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals. The existing City of San Marcos General Plan identifies the following goals and policies related to hazardous materials and waste.

Element	Topic Area	Goal	Policy
Safety Element	Hazardous Materials	Goal S-4: Protect life, structures, and the environment from the harmful effects of hazardous materials and waste.	Policy S-4.1: Promote and support the proper disposal, handling, transport, delivery, treatment, recovery, recycling, and storage of hazardous materials in accordance with applicable federal, State, and local regulations. Policy S-4.2: Require areas of known or suspected contamination to be assessed prior to reuse or redevelopment. Plan for reuse of contaminated areas in a manner that is compatible with the nature of the contamination and subsequent remediation efforts. Policy S-4.3: Require that land uses using hazardous materials be located and designed to ensure sensitive uses, such as schools, hospitals, day care centers, and residential neighborhoods, are protected. Policy S-4.4: Avoid locating sensitive uses near established hazardous materials users or industrial areas where incompatibilities would result, except in cases where appropriate safeguards have been developed and implemented.

Source: City of San Marcos General Plan, 2012

4.1.1 Environmental Setting

EnviroStor Data Management System

The California Department of Toxic Substances Control (DTSC) maintains the EnviroStor data management system, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation/Investigation Sites. The hazardous waste facilities include: Permitted-Operating, Post-Closure Permitted, and Historical Non-Operating.

There are four active site locations with an address in the Planning Area that are listed in the EnviroStor database:

- San Marcos Landfill located at 1595 Questhaven Road – Facility was referred to RWQCB for further corrective action at the facility as of 3/5/1997. Landfill operations ceased on 3/11/1997; the former 200-acre landfill has been revegetated with native coastal sage scrub and chaparral habitat and is designated as open space.
- 670 San Marcos Boulevard – Site was formerly occupied by an ARCO gas station. All tanks were removed with no contamination from the tanks. Facility was referred to City of San Marcos for evaluation as of 8/24/2000. The site has since been redeveloped as part of a larger retail-commercial development.
- Signet Armorlite Inc. (SAI) located at 1001 Armorlite Drive – The primary operations generated waste streams from the manufacturing of plastic eyeglass lenses, and included the storage of nonchlorinated waste solvents, sodium hydroxide and water, and chlorinated waste solvents. As a treatment facility, SAI utilized two recovery units: one carbon adsorption unit and one distillation unit. The units were used to recover methylene chloride. The facility was formally clean and closed by the U.S. EPA in a letter dated 6/30/1992. Records indicate that in December 1997, the facility was referred to the Regional Water Quality Control Board (RWQCB) – San Diego Region, for further corrective action at the facility.
- BAE Systems Aerospace Inc. located at 1370 San Marcos Boulevard – Facility was referred to RWQCB for further corrective action at the facility as of 1/1/2008.

Cortese List

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. The DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. There are no hazardous materials release sites located in the Planning Area listed on the Cortese List.

GeoTracker

GeoTracker is the California State Water Resources Control Board's (SWRCB) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Leaking Underground Storage Tank Sites, Department of Defense Sites, Cleanup Program Sites).

Leaking Underground Storage Tanks (LUST)

There are 68 locations within the Planning Area that are listed in the GeoTracker database for Leaking Underground Storage Tanks (LUST). Table 4-1 lists the site name for LUSTs in the Planning Area and the status of each site. As shown in the table, the vast majority of LUST sites in the Planning Area have a status of Completed – Case Closed. However, three locations have open cases – two under Site Assessment and one undergoing Remediation.

Table 4-1: Geotracker Database LUST Sites

Site Name	Status
7-ELEVEN FOOD STORE #18977	Completed - Case Closed
A G WRIGHT EQUIPMENT RENTAL	Completed - Case Closed
ABANDONED GASOLINE STATION (670 W SAN MARCOS BL)	Completed - Case Closed
ABES TOWING	Completed - Case Closed
AIR PRODUCTS & CHEMICALS INC	Completed - Case Closed
AMERICAN FENCE CO	Completed - Case Closed
ARCUS DATA SECURITY, INC	Completed - Case Closed
ARMORLITE INC	Completed - Case Closed
BORGIA ENTERPRISES	Completed - Case Closed
CDF-FORMER SAN MARCOS FOREST FIRE STATION	Completed - Case Closed
CHEVRON	Completed - Case Closed
CIRCLE K STORES DC 36 #2969	Completed - Case Closed
CITY OF SAN MARCOS REDEVELOPMENT - FORMER CHEVRON SITE	Completed - Case Closed
CLARENCE OCHS OIL	Completed - Case Closed
CONOCO PHILLIPS	Completed - Case Closed
CRM AUTOMOTIVE REPAIR	Open - Site Assessment
EDCO WASTE & RECYCLING SERVICE	Completed - Case Closed
FIRST NATIONAL BANK/N COUNTY	Completed - Case Closed
FIVE STAR TEXACO SERVICE CNTR	Completed - Case Closed
FOLLIS MILLWORK	Completed - Case Closed
FOREIGN CAR SPECIALISTS	Completed - Case Closed
FRITO LAY INC	Completed - Case Closed
GLENN YOUNG ARCO #6200	Completed - Case Closed
GOURMET LIQUOR 100944	Completed - Case Closed
GRAND CHANNEL BRIDGE PROJECT - CITY OF SAN MARCOS	Completed - Case Closed
HOLLANDIA DAIRY	Completed - Case Closed
JUAN S CHAVIRA CHEVRON SERVICE	Completed - Case Closed
JUDD WIRE	Completed - Case Closed
LAKE SAN MARCOS COUNTRY CLUB	Completed - Case Closed
LLOYD PEST CONTROL	Completed - Case Closed
LUSARDI CONSTRUCTION CO	Completed - Case Closed
MAR-CON PRODUCTS INC	Completed - Case Closed

MARDEN SUSCO	Completed - Case Closed
MORALLY WHOLESALE INC	Completed - Case Closed
NAPP SYSTEMS	Completed - Case Closed
NATIONSRENT, INC.	Completed - Case Closed
PAC WEST CONSTRUCTION	Completed - Case Closed
PACIFIC HANDRAIL & FENCE CO	Completed - Case Closed
PACIFIC PRIDE	Completed - Case Closed
PACIFIC PRIDE, SKS, SAN MARCOS	Completed - Case Closed
PALM SPRINGS OIL CO (CHEVRON)	Completed - Case Closed
PALOMAR COMMUNITY COLLEGE	Completed - Case Closed
PIONEER MILLS	Completed - Case Closed
RANCHO SANTA FE EXXON	Open - Remediation
ROLLINS LEASING CORP #107-B	Completed - Case Closed
ROOFING WHOLESALE, INC	Completed - Case Closed
SAM COUTTS PLASTERING INC	Completed - Case Closed
SAN DIEGO AUTO CENTER	Completed - Case Closed
SAN DIEGO UNION TRIBUNE	Completed - Case Closed
SAN MARCOS CARWASH	Open - Site Assessment
SAN MARCOS GAS	Completed - Case Closed
SAN MARCOS HDQTRS/DIVISION II	Completed - Case Closed
SAN MARCOS NCRRF	Completed - Case Closed
SAN MARCOS TEXACO	Completed - Case Closed
SCHMID INSULATION CONTRACTORS	Completed - Case Closed
SHELL	Completed - Case Closed
SIX TO SIX EQUIP RENTALS	Completed - Case Closed
SKS, SAN MARCOS	Completed - Case Closed
STAR BUILDER SUPPLY	Completed - Case Closed
TIMOTHY CHATTON	Completed - Case Closed
TLC CARWASH	Completed - Case Closed
TOSCO MKG CO #5965	Completed - Case Closed
TRI-M-CO	Completed - Case Closed
UNOCAL	Completed - Case Closed
US POST OFFICE	Completed - Case Closed
VALLECITOS WATER DISTRICT	Completed - Case Closed
WALTER TRUCKING, INC, R.D.	Completed - Case Closed
WINLAND I LIMITED/TOPMARK INC.	Completed - Case Closed

Source: California State Water Resources Control Board GeoTracker, March 2020.

Solid Waste Information System

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by California's Department of Resources Recycling and Recovery (CalRecycle). The SWIS database identifies

active, planned, and closed sites, including landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites. There are 5 facilities listed in the SWIS database located within the Planning Area. Two of these facilities are landfills located within the City, and they are both closed. EDCO operates a waste and recycling facility at 224 South Los Posas Road, handling mixed municipal waste. The final facility is Benchmark Landscape, located at 145 North Pacific Street, which only hauls green materials although their local office.

Table 4-2: Solid Waste Information System Sites

SWIS Number	Site Name	Type	Status
37-AA-0008	San Marcos Landfill	Solid Waste Landfill	Closed
37-AO-0009	Old San Marcos Landfill	Solid Waste Disposal Site	Closed
37-AA-0953	EDCO CDI Recycling	Medium Vol CDI Debris Proc. Fac.	Active
37-AA-0969	EDCO Waste and Recycling - LVT Op.	Limited Volume Transfer Operation	Active
37-AA-0986	Benchmark Landscape	Limited Volume Transfer Operation	Active

Source: CalRecycle, March 2020.

4.1.2 References

Data and information found in this section primarily came from the following sources:

California Department of Resources Recycling and Recovery (CalRecycle). 2020. https://www2.calrecycle.ca.gov/SWFacilities/Directory/

California Department of Toxic Substances Control. 2020. EnviroStor Database. http://www.envirostor.dtsc.ca.gov/public/

California State Water Resources Control Board. 2020. https://geotracker.waterboards.ca.gov/

City of San Marcos. 2012. City of San Marcos General Plan.

4.2 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2011), prepared by the State Division of Aeronautics, 18.2% of general aviation accidents occur during takeoff and initial climb and 44.2% of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability. The existing City of San Marcos General Plan identifies one policy related to airport facilities.

Element	Topic Area	Goal	Policy
Safety Element	Emergency Preparedness / Neighborhood Safety	Goal S-7: Comply with the McClellan-Palomar Airport Land Use Compatibility Plan.	Policy S-7.1: Record an overflight notification document in association with the approval of any new residential land use within the AIA overflight notification area consistent with the ALUCP. See Figure 6-5 McClellan-Palomar Airport Influence Area.

Source: City of San Marcos General Plan, 2012

4.2.1 Environmental Setting

City of San Marcos General Plan

The existing City of San Marcos General Plan identifies only one policy related to airport facilities as noted above.

McClellan-Palomar Airport

McClellan-Palomar Airport is located in the City of Carlsbad, approximately 2.5 miles west of the City of San Marcos. It is a general aviation airport owned and operated by the County of San Diego. The McClellan-Palomar Airport Master Plan was adopted by the County of San Diego in October 2018 and sets forth land use compatibility policies that are intended to ensure that future land uses in the surrounding area will be compatible with potential long-range aircraft activities at the airport, and that the public's exposure to safety hazards and noise impacts are minimized.

In December 2011, the San Diego County Airport Land Use Commission (ALUC) adopted the amended McClellan-Palomar Airport Land Use Compatibility Plan (ALUCP) for McClellan-Palomar Airport. The basic function of airport land use compatibility plans is to promote compatibility between airports and the land uses that surround them. The ALUCP policy document establishes policies applicable to land use compatibility planning in the vicinity of McClellan-Palomar Airport.

As described in the ALUCP and shown in Figure 4-1, a majority of the Planning Area is considered to be in the Airport Influence Area (AIA), which is defined as "the area in which current or future airport-related noise, overflight, safety, or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses" (California Business and Professional Code 11010[b][13][b]). The McClellan-Palomar AIA is divided into Review Area 1 and Review Area 2, with only Review Area 2 encompassing

portions of the Planning Area (approximately two-thirds of the Planning Area). Review Area 2 consists of locations beyond Review Area 1, but within the airspace protection and/or overflight notification areas. Limits on the heights of structures, particularity in areas of high terrain, are the only restrictions on land uses within Review Area 2. Proponents of a project containing structures or other objects within Review Area 2 that may exceed the height standards defined by Part 77 of the FAA's Federal Aviation Regulations and depicted on Exhibit III-3 of the ALUCP must submit notification of the proposal to the FAA where required by the provisions of Part 77. For San Marcos, the height threshold increases from west to east ranging from a low of 625 feet above mean sea level (nearest to airport) to 1,526 feet above mean sea level (farthest from airport). The FAA will conduct an "aeronautical study" of the object(s) and determine whether the object(s) would be of a height that would constitute a hazard to air navigation. These requirements apply to all objects including structures, antennas, trees, mobile objects, and temporary objects, such as construction cranes. The recordation of overflight notification documents is also required in locations within Review Area 2 as part of a real estate disclosure intended to inform potential buyers of annoyances or inconveniences associated with proximity to airport operations.

Pat Coyle Memorial Heliport: Pat Coyle Memorial Heliport is a private-use heliport owned and operated by the San Diego County Sheriff's Department. It is located at the City of San Marcos Sheriff's Station at 182 Santar Place.

Major Regional Airport Facilities

San Diego International Airport (SAN): SAN is owned and operated by the San Diego County Regional Airport Authority and is approximately 29 miles away from the City of San Marcos. The airport is located northwest of Downtown San Diego and is the busiest airport serving the San Diego region. It is also the busiest single runway airport in the United States; in 2019, SAN handled over 25 million passengers.

Other Nearby Airport Facilities

Marine Corps Air Station Miramar: Marine Corps Air Station Miramar is a United States Marine Corps installation that is home to the 3rd Marine Aircraft Wing, which is the aviation element of the 1st Marine Expeditionary Force. It is located in Miramar, San Diego, about 14 miles north of Downtown San Diego and approximately 17 miles away from the City of San Marcos.

Camp Pendleton Air Terminal: Camp Pendleton Air Terminal is a United States Marine Corps airfield located within Marine Corps Base Camp Pendleton. It is currently home to Marine Aircraft Group 39. The airfield is also known as Munn Field and is approximately 15 miles away from the City of San Marcos.

Ramona Airport: Ramona Airport is a public airport two miles west of Ramona, in San Diego County. The airport is mostly used for general aviation; however, the California Department of Forestry (CDF) and the United States Forest Service (USFS) jointly operate a fire attack base there. It is approximately 16 miles away from the City of San Marcos.

Oceanside Municipal Airport: Oceanside Municipal Airport (Bob Maxwell Field) is a public airport located in the City of Oceanside. The airport covers 43 acres and has one runway. It is mostly used for general aviation and is operated and managed by Airport Property Ventures. Oceanside Municipal Airport is approximately 11 miles away from the City of San Marcos.

National Transportation Safety Board Aviation Accident Database

The National Transportation Safety Board Aviation Accident Database identifies a total of three historical aircraft accidents in San Marcos. The earliest record for an aircraft accident in San Marcos is from June 7, 1989 (fatal-2). The most recent incident is from February 6, 1995 (fatal-4). Out of the three recorded aircraft accidents in San Marcos, two were fatal accidents causing a total of six deaths (NTSB, 2020). These incidents were small-scale (primarily prop planes and other small planes) that involved three different scenarios, including pilot error (crash), fuel starvation (emergency landing), and weather (crash).

4.2.2 Approach/Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phases of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77 percent of approach/landing accidents occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions (California Division of Aeronautics 2001).

The remaining 23 percent of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway (California Division of Aeronautics 2001).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed (California Division of Aeronautics 2001).

4.2.3 Takeoff/Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65 percent of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem (California Division of Aeronautics 2001).

4.2.4 References

Data and information found in this section primarily came from the following sources:

California Department of Transportation, Division of Aeronautics. California Airport Land Use Planning Handbook. 2011.

City of San Marcos. 2012. City of San Marcos General Plan.

McClellan-Palomar Airport Land Use Compatibility Plan. 2010. San Diego County Regional Airport Authority.

McClellan-Palomar Airport Master Plan Update. October 2018. County of San Diego.

National Transportation Safety Board, 2020. Aviation Accident Database & Synopses. https://www.ntsb.gov/_layouts/ntsb.aviation/Results.aspx?queryId=c28e0f03-3d39-4ffb-85f6-3f3fb10182f9

4.3 FIRE HAZARDS

In May 2014, a swarm of 20 wildfires erupted in San Diego County during severe Santa Ana wind conditions, historic drought conditions, and a heat wave. The Cocos Fire was one such wildfire that ignited on May 14, 2014 in San Marcos, in the hills south of California State University, San Marcos. The Cocos Fire quickly spread into western Escondido and destroyed more than 40 buildings, including a dozen single-family homes. All schools in the San Marcos Unified School District were closed on as a result of the Cocos Fire. Likewise, CSUSM was evacuated on May 14, along with the surrounding neighborhoods, and remained closed for the week, cancelling commencement exercises. Palomar College also closed during this period.

This section addresses the hazards associated with wildfires in the Planning Area. The discussion of fire suppression resources, including fire station locations, is located in Section 3.0 (Utilities and Community Services) of this report. The existing City of San Marcos General Plan identifies the following goals and policies related to fires.

Element	Topic Area	Goal	Policy
Safety Element	Fire Hazards	Goal S-3: Minimize injury, loss of life, and damage to property resulting from structural or wildland fire hazards.	Policy S-3.1: Require development to be located, designed and constructed to provide adequate defensibility and reduce the risk of structural loss and life resulting from wildland fires. Development will consider hazards relative to terrain, topography, accessibility and proximity to vegetation. One such provision for development to minimize the risk of structural loss and life shall be the inclusion of overhead fire sprinklers. Policy S-3.2: Provide sufficient level of fire protection service to reduce risk from urban and wildland fire. Advocate and support regional coordination among fire protection and emergency service providers. Policy S-3.3: Require development to provide additional access roads when necessary to provide for safe access of emergency equipment and civilian evacuation concurrently. Policy S-3.4: Coordinate with fire protection and emergency service providers to assess fire hazards

			before and after wildfire events to adjust fire prevention and suppression needs, as necessary, commensurate with both short and long term fire prevention needs. Policy S-3.5: Support programs and plans, such as Strategic Fire Plans, consistent with state law that require fuel management/modification within established defensible space boundaries and when strategic fuel modification is necessary outside of defensible space, balance fuel management needs to protect structures with the preservation of native vegetation and sensitive habitats. Wildfire Planning Policy S-3.6: Protect communities from unreasonable risk of wildfire within very high fire hazard severity zones. a. Assess site constraints when considering land use designations near wildlands to avoid or minimize wildfire hazards as part of a community plan update or amendment. b. Identify building and site design methods or other methods to minimize damage if new structures are located in very high fire hazard severity zones on undeveloped land and when rebuilding after a fire. c. Require ongoing brush management to minimize the risk of structural damage or loss due to wildfires. d. Provide and maintain water supply systems to supplies for structural fire suppression. e. Provide adequate fire protection.

			Policy S-3.7: Incorporate fire safe design into development within very high fire hazard severity zones (VHFHSZs) to have fire-resistant building and site design, materials, and landscaping as part of the development review process. a. Minimize new residential development in VHFHSZs, and locate future public facilities, including new essential and sensitive facilities, outside of VHFHSZs when possible b. Locate, design and construct development to provide adequate defensibility and minimize the risk of structural loss from wildland fires. b. Design development on hillsides and canyons to reduce the increased risk of fires from topography features (i.e., steep slopes, ridge saddles). c. Minimize flammable vegetation and implement brush management best practices in accordance with the Zoning Ordinance. d. Design and maintain public and private streets for adequate fire apparatus vehicles access (ingress and egress) and install visible street signs and necessary water supply and flow for structural fire suppression. e. Coordinate with the San Marcos Fire Department to provide and maintain adequate fire breaks where feasible or identify other methods to slow the movement of a wildfire in VHFHSZs. Policy S-3.8: Implement brush management along City maintained roads in very high fire hazard severity

			zones adjacent to open space and canyon areas. Policy S-3.9: Maintain access for fire apparatus vehicles along public streets in very high fire hazard severity zones for emergency equipment and evacuation. Policy S-3.10: Provide wildland fire preparedness education for fire safety advance planning. Policy S-3.11: Coordinate with local, state, and federal fire protection agencies with respect to fire suppression, rescue, mitigation, training and education. Policy S-3.12: Coordinate with local, state, and federal agencies to update emergency, evacuation, and hazard mitigation plans, as necessary. Policy S-3.13: Support city-wide emergency and disaster preparedness education programs. Policy S-3.14: Locate, when feasible, new essential public facilities and utilities outside of very high fire hazard severity zones, including but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, and emergency communication facilities, or identify construction methods or other methods to minimize damage if these facilities are located in very high fire hazard severity zones.

Source: City of San Marcos General Plan, 2012.

4.3.1 Identifying Fire Hazards

Fuel Rank

Fuel rank is a ranking system developed by CalFire that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

- The U.S. Forest Service has developed a series of **fuel models**, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior.
- In addition to fuel characteristics, **slope** is an important contributor to fire hazard levels. A surface ranking system has been developed by CalFire, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10 percent, 11-25 percent, 26-40 percent, 41-55 percent, 56-75 percent, and greater than 75 percent. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.
- The **ladder index** is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species.
- The **crown index** is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index, and crown index for a given area are combined in order to establish a fuel rank of medium, high, or very high. Fuel rank is used by CalFire to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The fuel rank data are used by CalFire to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme.

4.3.2 Fire Hazard Severity Zones

The State has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend draft Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards. The Planning Area includes both Local Responsibility Areas and State Responsibility Areas (within the Sphere of Influence), with portions of both Local and State Responsibility Areas being designated as Very High Fire Hazard Severity Zones. Figure 4-2 shows Fire Hazard Severity Zones in San Marcos.

Local Responsibility Areas

Local Responsibility Areas (LRA) lie within the city boundaries and CalFire has made recommendations that fall under two categories – Very High Fire Hazard Severity Zone (VHFHSZ) and Non-VHFHSZ. The hillside areas north of SR-78 in the Santa Fe Hills and Twin Oaks Valley Neighborhood, and the hillside areas south of SR-78 in the Barham/Discovery Community and Questhaven/La Costa Meadows Neighborhood, are designated as VHFHSZ that are LRAs. Areas within the Lake San Marcos Neighborhood, which is within the Sphere of Influence (SOI), are also designated as VHFHSZ that are LRAs.

State Responsibility Areas

The State Responsibility Areas (SRA) within the Planning Area are in the SOI in the north part of the City in the Twin Oaks Valley Neighborhood and also in the south east off of country club drive. These areas range in severity from moderate to very high.

Federal Responsibility Areas

There are no Federal Responsibility Areas within the vicinity of San Marcos.

4.3.3 Fire Hazard Planning

Fire hazard and mitigation are an important component to fire safety and enhances the effectiveness of fire protection. The City's General Plan address wildland fire risk reduction and prevention, how to minimize fire hazards resulting from structural fires, and hazard mitigation efforts through policies within the Safety Element as well as the Land Use and Community Design Element, Conservation and Open Space Element, and Mobility Element.

4.3.4 Wildland Fires

Wildland urban interface (WUI) areas have steep slopes, limited precipitation, and plenty of available fuel/combustible plant material. In an effort to reduce the threat posed by wildland fire events, the SMFD completed a comprehensive assessment of WUI fire hazards and prepared a Community Wildfire Protection Plan (CWPP) and Hazard Risk Assessment (HRA) for the San Marcos community and unincorporated areas in the San Marcos Fire Protection District. This assessment and the CWPP/HRA identify areas as WUI study areas to prioritize hazardous fuel removal and reduce overall community fire risks (SMFD 2007).

The SMFD has mapped WUI areas denoting community hazard levels as part of the HRA; see Figure 6-4. Brush management is required to be undertaken in these areas where urban development interfaces with open space so that fire fuel loads and potential fire hazards can be reduced. The CWPP/HRA also identifies actions to protect one or more WUI study area neighborhoods, and identifies training, public education, and local resource needs (SMFD 2007).The CWPP meets the requirements of the federal Healthy Forests Restoration Act (HFRA) of 2003 for community fire planning (SMFD 2007).

In accordance with the CWPP and the Zoning Ordinance, all new development in identified community hazard areas requires a Fuel Management Plan. This includes clearing and maintaining defensible space of 100 to 150 feet around structures, depending on the structure and vegetation type. Safety development and fuel reduction zones will continue to be addressed by developers and SMFD as outlined by the CWPP or applicable City ordinances. Additional SMFD community fire planning efforts include the vegetation management program to reduce the possibility of major wildland fires. Vegetation management programs are administered by program area, assessing a special tax on specific City-owned and private communities to help maintain open space area vegetation within these developments (SMFD 2007).

4.3.5 Urban Fires

Urban fires in the community have the potential to cause significant loss of life and property; however, improvements in architecture, building design, construction materials, and emergency response reduce the likelihood of catastrophic occurrences. For additional information regarding service levels and facilities for fire and emergency services within the City, see Chapter 2, Land Use and Community Design Element, of this document.

4.3.6 References

Data and information found in this section primarily came from the following sources:

California Department of Forestry and Fire Protection. 2020. Fire Hazard Severity Zone Maps https://osfm.fire.ca.gov/media/5970/san_marcos.pdf

California Department of Forestry and Fire Protection and State Board of Forestry and Fire Protection. 2010. 2010 Strategic Fire Plan for California.

City of San Marcos. 2012. City of San Marcos General Plan.

4.4 FLOODING

This section addresses the hazards associated with flooding in the Planning Area. The discussion of storm drainage infrastructure is located in Section 3.0 (Utilities and Community Services) of this report. The discussion of hydrological conditions and water quality is located in Section 5.0 (Conservation and Natural Resources). The existing City of San Marcos General Plan identifies the following goals and policies related to flooding.

Element	Topic Area	Goal	Policy
Safety Element	Flooding Hazards	Goal S-2: Minimize the risk to people, property and the environment due to flooding hazards.	Policy S-2.1: Continue to provide well-maintained regional flood control facilities capable of accommodating, at a minimum, 100-year storm flows consistent with federal requirements. Policy S-2.2: Require existing private development to take responsibility for maintenance and repair of structures to resist flood damage.

Source: City of San Marcos General Plan, 2012

4.4.1 Environmental Setting

Flooding is a temporary increase in water flow that overtops the banks of a river, stream, or drainage channel to inundate adjacent areas not normally covered by water.

San Marcos is made up of both developed and undeveloped areas. The developed areas are largely paved which may reduce infiltration and increase surface runoff, which can increase the risk of localized flooding. The recent use of stormwater requirements, such as minimum standards for Low Impact Development (LID), has helped attenuate flows; however, flooding may still occur, particularly in low spots, where infrastructure is unable to accommodate flows during a storm, or when large releases of water occur in a hazardous event. In most cases, localized flooding dissipates quickly after heavy rain ceases. For additional information on stormwater and drainage infrastructure see Section 3.0 (Utilities and Community Services).

FEMA Flood Zones

The Federal Emergency Management Agency (FEMA) has a database that maps flood potential across the United States. FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage state and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Planning Area is shown on Figure 4-3.

As shown in Figure 4-3, portions of San Marcos are located within the 100-year FEMA flood zone. The 100-year flood zone indicates areas with a one percent annual chance of flooding. The FEMA-designated 100-year floodplains and floodways are associated with San Marcos Creek and its tributaries such as the north branch in Twin Oaks Valley, the east branch east of City Hall and south of Mission Road, and Lake San Marcos and a smaller drainage west of Palomar Community College, which extends south beyond SR-78. There is also a small portion of San Marcos located within a mapped portion of the 500-year FEMA flood zone. The 500-year flood zone indicates areas with minimal flood hazard. Some areas documented to be subject to 100-year flooding within San Marcos are developed and therefore a significant rain event could cause flooding in the zones identified, potentially resulting in damage to structures.

Dam Inundation

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. San Marcos lies generally downstream of dams, reservoirs, and debris basins that ultimately flow toward the City. There are four dams that have the potential to inundate portions of the Planning Area in the event of dam failure. These four dams are located at the following lakes: South Lake, Discovery Lake, Lake San Marcos, and Jack's Pond. Each of these dams are discussed in detail below. Dam inundation areas are shown on Figure 4-4. Inundation hazards can range from high to low with increasing distance away from these water containment structures.

- South Lake is located up gradient from Discovery Lake, and a failure of the upper dam is shown to overwhelm the lower dam. In such an event, flooding would encompass much of the southwest portion of San Marcos Creek Valley upstream of Lake San Marcos. City studies suggest that dam inundation flooding from South Lake/Discovery Lake could involve approximately 73.3 million gallons (about 225 acre-feet) of water (San Marcos Safety Element 2012).
- Discovery Lake is a small (approximately eight acre) lake located in the southern portion of San Marcos and used for conservation and recreation purposes.
- Lake San Marcos is a large artificial pond (approximately 64 acres) currently used for recreational purposes. The community of Lake San Marcos is unincorporated San Diego County within the San Marcos SOI. A failure of Lake San Marcos Dam would flood San Marcos Creek downstream (south) of the dam. Lake San Marcos Dam is under the jurisdiction of the State of California Department of Water Resources, Division of Safety of Dams.
- Jack's Pond is a small water body located in the eastern portion of San Marcos.

These dams do not have a history of dam failure. Monitoring and mitigation of dam failure is constantly occurring at both the federal and state levels.

4.4.2 References

California Dept. of Water Resources. 2019. Dams Within Jurisdiction of the State of California. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/2019-Dams-Within-Jurisdiction-of-the-State-of-California-Alphabetically-by-County_a_y20.pdf

California Dept. of Water Resources. 2020. Best Available Maps (BAM). http://gis.bam.water.ca.gov/bam/

City of San Marcos. 2012. City of San Marcos General Plan.

San Diego County. 2020. SanGIS (Flood Plain layer). March, 2020.

Vallecitos Water District. 2020. http://www.vwd.org/

4.5 CLIMATE CHANGE AND RESILIENCY PLANNING

This section addresses hazards associated with climate change as well as resiliency planning and adaptation strategies. For additional information on climate change and greenhouse gases, see Section 5.0 (Conservation and Natural Resources). Information in this section is primarily from the *Climate Change and Health Profile Report for San Diego County* and the California State Legislature's *Senate Environmental Quality Committee Report on Southern California Regional Adaptation Efforts to Climate Change Impacts*.

4.5.1 Background

Climate change is having global and local impacts that are occurring in response to greenhouse gas (GHG) emissions from human activities, as noted in the Fifth Assessment Report (AR5) by the Intergovernmental Panel on Climate Change (IPCC). These global changes are manifesting in varied environmental health and infrastructure consequences for different countries, regions, and states, necessitating a change in public policy decision making in order to adapt to a new environment.

Over the next century, increasing atmospheric GHG concentrations are expected to cause a variety of changes to global climate conditions, including sea level rise (SLR) and storm surge in coastal areas, increased riverine flooding, and higher temperatures more frequently (leading to extreme heat events and wildfires), particularly in inland areas. Local impacts stemming from climate related conditions range from impacts to water quality and supply, public health, air quality, wildfires, and infrastructure. While weather changes are a normal, short-term change in atmospheric condition, climate change refers to changes in long-term averages in atmospheric condition. Scientists attribute recent climate change trends to human expansion of greenhouse gases into the atmosphere. Climate change can cause extreme weather conditions, including heat waves, more frequent droughts, heavier rainfall, and more powerful hurricanes.

Because local governments largely determine the size and character of development through land use plans, regulations, and implementing decisions, local governments play an important role in developing climate change strategies, including resiliency planning and adaptation, through local land use plans and policies. Many climate adaptation strategies will need to be coordinated as part of a larger regional or statewide strategy requiring cooperation by many local governments and decision-making and regulatory bodies.

4.5.2 Environmental Setting

In 2014, the San Diego Foundation and a collaboration called Climate Education Partners released a report on climate change and its impacts on the San Diego region titled *San Diego, 2050 is Calling. How Will We Answer?* Climate Education Partners – San Diego Region (CEP) is a collaborative team of multidisciplinary experts from the University of San Diego, UC San Diego's Scripps Institution of Oceanography, California State University San Marcos, The San Diego Foundation, and The Steve Alexander Group. This project and report is one of only six National Science Foundation projects funded through the Climate Change Education Partnership (CCEP) program. Key findings from this research include:

- The San Diego region can expect to experience hotter and more humid heat waves and less frequent but more intense rainfall. In the next 40 years, global temperatures could increase twice as fast as they have in the last 40 years; San Diego regional temperature increases are expected to exceed this trend.
- Warming, compounded by less frequent precipitation, will worsen droughts and threaten the region's imported and local water sources. Water demand is expected to increase 46 percent by

2035 due to the region's growing population, rising temperatures, longer intervals without rain, and increased evaporation from the soil and water reservoirs.

- Extreme high tides and winter storms magnified by sea level rise will result in more frequent and widespread coastal flooding. With higher sea levels and occasional heavy winter storms, the region's shoreline communities will be more vulnerable to beach loss and coastal cliff erosion.
- Wildfire seasons may be longer and more extreme, with warming temperatures, drier soils and vegetation, and less frequent rains. A hotter and drier climate, along with less frequent rainfall, will increase the frequency and severity of droughts and could alter fire fuel conditions in ways that promote larger, more catastrophic fires.
- The San Diego region's coastlines and beaches and the region's unique plants and animals, along with the benefits they provide to the people of the region, will be threatened. Rising temperatures and changes in rainfall patterns may occur much faster than plants and wildlife are able to adapt, threatening the survival of some species.
- More extended heat waves and less nighttime cooling will put some residents' health at risk. Extreme high temperatures and extended heat waves have historically caused heat-related illness and death for elderly, children, low-income residents and the chronically ill and may do so more frequently.

Other studies have indicated that a variety of changes to local climate conditions as a result of climate change are expected to occur, leading to several local conditions that may affect the region. For the City of San Marcos, possible future local conditions may include: increased urban flooding, higher temperatures, more frequent heat waves (leading to extreme heat events), increased risk of wildfire, water quality and water supply impacts, impacts to regional air quality, and other public health impacts.

Flooding

Precipitation change is a climate variable that is directly affected by changes in global atmospheric and oceanic temperatures. Projected changes in precipitation include annual trend changes as well as extreme precipitation events.

Riverine and local flooding is influenced by precipitation and local conditions, such as ground cover and soil conditions. Riverine flooding occurs when heavy rainfall causes rivers or creeks to overtop their banks and inundate surrounding areas during extreme weather events. Urban flooding commonly occurs when local stormwater infrastructure is overwhelmed during extreme precipitation events. According to the *Climate Change and Health Profile Report for San Diego County*, written by the California Department of Public Health, annual precipitation will vary by area within the San Diego Region but will decline overall throughout the century. Nonetheless, local model predictions include more extreme precipitation events, which in turn cause flood risks to worsen, increasing the likelihood of damaging infrastructure, increasing erosion and landslides, and overwhelming sewage treatment systems, which may reduce water quality and impact public health.

Water Supply and Quality

According to the *Climate Change and Health Profile Report for San Diego County*, overall mean precipitation amounts are expected to decrease slightly by 2050. It is also expected that climate change will likely impact water demand, water supply, and water quality of both surface and ground water.

The same study notes that for the San Diego Region, low-lying coastal areas will lose up to 2 inches of precipitation by 2050 and 3-5 inches by 2090, while higher elevations will see a drop of 4-5 inches by 2050 and 8-10 inches by 2090. Furthermore, March snowpack in the San Gabriel Mountains will decrease from the 0.7-inch level in 2010 to zero by the end of the century. With resulting decreased stream flows and higher temperatures, impacts could include a reduction of fish habitat, increased surface water temperatures, pollutant levels, and sedimentation, intensified algal growth, and subsequently, more harmful algal blooms. For groundwater, the potential for salt water intrusion into aquifers with sea level rise could be worsened by overpumping. The decreased water quality could further deteriorate as pollutant concentrations increase due to reduced water levels and recharge from drought and lack of snowpack.

Wildfires

Wildfires occur as a result of conditions affected by complex interactions between primary variables (including precipitation and temperature) and other factors (including changes in land cover type). A wildfire is an unplanned fire caused by lightning or other natural causes, by accidental (or arson-caused) human ignitions, or by an escaped prescribed fire. Weather is one of the most significant factors in determining the severity of wildfires; natural fire patterns are driven by conditions such as drought, temperature, precipitation, and wind, and also by changes to vegetation structure and fuel (i.e. biomass) availability. Wildfires pose a great threat to life and property, particularly when they move from forest or rangeland into developed areas.

Climate change is projected to increase the frequency of wildfire events, the extent of burned areas across California, and the duration of wildfire seasons. Wildfire seasons are projected to begin earlier in the spring due to drier and warmer spring conditions on average, potentially requiring longer periods for firefighting services. Greater inter-annual variability in temperature and precipitation may also affect wildfire intensity. For example, multiple wet years can result in larger fuel buildup in landscapes. This may result in increasingly intense and frequent wildfires, if followed by drought years. Wildfire risk will also vary depending on population growth and land use characteristics, including rates of residential expansion and infrastructure into fire prone areas over the next century.

In recent decades, southern California has experienced an increase in the area burned by wildfires. According to the *Southern California Fires Interdisciplinary Project*, the southern California fires in 2003 were widely considered a 100-year event, and the 2007 fires were responsible for billions of dollars in costs from firefighting, property damage, environmental erosion, ecosystem services, and human health impacts. In 2010, approximately 20.1% (620,849 residents) of San Diego County's total population lived in fire hazard zones of moderate to very high severity. By 2050, the region's fire season is projected to last three weeks longer with an increase of 24-124% in the annual amount of area burned (Yue et al. 2013).

Wildfires also contribute to reduced air quality through the elevated levels of particulate matter and ozone pollution, with implications for public health. Wildfire smoke can result in both short-term and long-term health impacts, from minor lung and eye irritation to premature death. Research on health impacts from the 2003 southern California wildfires showed an increase in hospital admissions for respiratory problems during the fires, including asthma attacks, acute bronchitis, and chronic obstructive pulmonary disorder (COPD), with small increases in cardiovascular admissions. The research further suggested that improved prevention measures are needed to reduce illness in vulnerable populations (Finlay et al. 2012).

Extreme Heat

Temperature (near surface) is a climate variable that is directly affected by changes in global atmospheric and oceanic conditions. While trends in average annual temperature are an important indicator of climate change, extreme temperature events have greater impacts on society due to their episodic nature. Therefore, vulnerability and risk assessment tends to specifically focus on extreme heat events and not on average temperature changes. The IPCC defines extreme heat events as a period of abnormally hot weather. While extreme heat events can have various durations, Cal-Adapt defines an extreme heat event as a period of five or more consecutive extreme heat days. Cal-Adapt defines an extreme heat day in a given region as a day in April through October where the maximum temperature exceeds the 98th historical percentile of maximum temperatures for that region based on daily temperature data from 1961 to 1990. The 98th historical percentile of maximum temperatures varies by locality and inland areas tend to be at a greater risk of extreme heat events when compared to areas near the coast.

Increasing numbers of extreme heat days are projected in the coming decades. The *Public Health-Related Impacts of Climate Change in California* report points out that increasing high heat days from climate change have a number of impacts on communities, including direct heat-related mortalities and worsening of chronic health conditions (Drechsler et al. 2006). Southern California already experiences energy shortages, and higher demand from more frequent and intense high heat days could further impact health.

As noted by the California Department of Public Health Report, *Climate Change and Health Profile Report for San Diego County*, extreme heat days can lead to adverse health impacts and worsen many existing medical conditions, including respiratory disease, diabetes, kidney, and heart disease. Some residents in California who will be exposed to extreme heat days are at the greatest risk for related health problems. Reasons for this higher amount of risk include a combination of lack of air conditioning or shaded areas, outdoor work exposure to air pollutants, and preexisting health conditions. The California Department of Public Health Report notes that as of 2010, there were approximately 81,644 outdoor workers in San Diego County whose occupation increased their risk of heat illness and in 2009 approximately 47% of San Diego County households were estimated to lack household air conditioning, thus increasing the risk of heat-related health impacts.

Increased Risk and Spread of Diseases

In addition to the health impacts related to air and water quality, warmer temperatures and drought conditions can contribute to the spread of diseases by aiding development and spread of the vectors that transmit them (Drechsler et al. 2006). A vector-borne disease (VBD) is one caused by a virus, bacteria, or protozoan that spends part of its lifecycle in a host species (e.g., mosquitoes, ticks, fleas, rodents), which subsequently spreads the disease to other animals and people.

Regional research assessments have previously concluded that climate change and variability are highly likely to influence current VBD spread, including both short-term outbreaks and shifts in long-term disease trends. For example, as temperatures rise, mosquito reproductive cycles are shortened, allowing more breeding cycles each season, and viral transmission rates rise sharply (Githeko et al. 2000). Mosquitoes are an increasing vector of concern, particularly those species that have been introduced from other countries because changes in temperature and precipitation conditions can allow exotic species to become established in places where they could not previously survive year-round.

In San Diego County, there are multiple invasive mosquito species including the Aedes aegypti (the yellow fever mosquito), which has been detected in neighboring Escondido. These invasive mosquitoes bite aggressively during the day and can spread a variety of disease, including chikungunya, yellow fever, and dengue, as seen with recent outbreaks in Florida and Texas. Once established, the mosquitoes can reproduce in extremely small amounts of water and are very difficult to control.

The California Department of Public Health further notes three vector-borne diseases that climate change may impact in the state: hantavirus, Lyme disease, and West Nile virus (WNV). As the ecology of vectors changes with climate, exposure to disease in people may increase significantly.

4.5.3 Climate Change and Resiliency Planning Efforts

State Efforts in Climate Adaptation

Key documents that summarize climate impacts in sectors and regions and provide adaptation guidance include the 2014 Safeguarding California report, focused at the state level, and the California Adaptation Planning Guide (2012) to support local governments and regional collaboratives. Additionally, Cal-Adapt was designed to be a web-based climate adaptation planning tool for local planning efforts with downscaled climate change scenarios and research for regions within California.

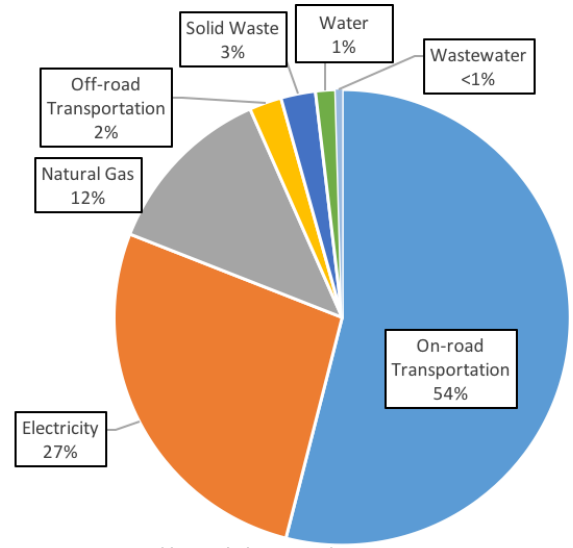
Local and Regional Efforts in Climate Adaptation

In southern California there are a number of regional collaboratives, agencies, academic institutions, and local governments engaged in climate change mitigation, adaptation, and research. A subset of the work from these many stakeholder groups is highlighted here.

The City of San Marcos adopted a Climate Action Plan (CAP) in 2013 in compliance with the adopted policies in the General Plan and consistent with Assembly Bill (AB) 32, known as the Global Warming Solutions Act of 2006. The Climate Action Plan is a long-range plan that outlines strategies to reduce greenhouse gas (GHG) emissions. Support from the SANDAG Roadmap Program enabled the City to then initiate an update to its CAP in 2017. The CAP update was needed to comply with the Senate Bill (SB) 32 requirements to reduce GHG emissions to 40 percent below the 1990 levels by 2030. The main elements of the CAP include: a GHG emissions inventory and projections; GHG reduction targets and measures; a monitoring strategy; and a Development Review Checklist and Implementation Cost Analysis.

The GHG inventory and projections document summarizes emissions from 2012 to 2014 and the business-as-usual projections for 2020, 2030 and 2035. The total GHG emissions from San Marcos in 2012 were estimated at 599,000 metric tons CO_2e (MT CO_2e), distributed into categories as shown in the chart below.

Breakdown of GHG Emissions in San Marcos (2012)



The County of San Diego adopted a Climate Action Plan in 2018 to address resource management, transportation, and energy concerns related to climate change for the unincorporated areas of the county, including the areas with San Marcos's Sphere of Influence. The CAP is a plan that identifies strategies and measures to reduce the County's contribution of greenhouse gas emissions to the atmosphere to meet the State's 2020 and 2030 GHG emissions targets, and to demonstrate progress towards the 2050 GHG reduction goal.

The Alliance of Regional Collaboratives for Climate Adaptation (ARCCA) is a network of regional collaboratives across the state that strives to build regional resilience to climate impacts, and includes two collaboratives in southern California: the Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC) and the San Diego Regional Climate Collaborative (SDRCC).

SDRCC, with support from The Hub at The Nonprofit Institute at The University of San Diego, fosters a network of local and regional decision-makers in the San Diego County region for both climate mitigation and adaptation work across sectors and locally focused research on impacts. Members include groups from academia, cities, San Diego County, regional agencies, nonprofits, and businesses. Part of SDRCC's goals include serving as a convening body to ensure consistency in performance, collaboration, and coordination of climate actions to maximize limited resources. SDRCC also facilitates the exchange of the latest scientific research, best practices for policy development, information systems, and education efforts.

The San Diego Association of Governments (SANDAG) developed a Climate Action Strategy in 2010. The Strategy identifies a range of potential policy measures – "tools in the toolbox" – for consideration as SANDAG updates long-term planning documents like the Regional Transportation Plan and Regional Comprehensive Plan, and as local jurisdictions update their General Plans and other community plans. The Strategy helps SANDAG identify land use, transportation, and related policy measures and investments that could reduce greenhouse gases from passenger cars and light-duty trucks as part of the development of a Sustainable Communities Strategy for the 2050 Regional Transportation Plan in compliance with Senate Bill 375. Potential policy measures also are identified for buildings and energy use, protecting transportation and energy infrastructure from climate impacts, and to help SANDAG and local jurisdictions reduce greenhouse gases from their operations.

Additionally, the State and Regional Water Boards have been working to coordinate climate action planning. The San Diego Regional Water Quality Control Board has been engaging in a dialogue with state and federal colleagues to develop a framework for adaptation within their programs.

4.5.4 References

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4.6 WILDLIFE HAZARDS

This section contains a brief account of the species of wildlife found in the southern California region that are considered at times to be nuisances or pose a danger to humans and domestic animals.

Southern California is home to a variety of species, many of which are encountered in urban and suburban areas. Some of these species are attracted to human landscapes, as these are artificial sources of food, water, and shelter; additionally, wildlife may find areas of human habitation to be void of predators and competitors. Other environmental and climatic conditions may also be driving wildlife into developed urban and suburban areas including drought, lack of food sources, wildfire, and climate change. The following discussion focuses on several species common in southern California including coyotes, black bears, mountain lions, and rattlesnakes. Information in this section is primarily from the California Wildlife Habitat Relationships System, California Department of Fish and Wildlife (CDFW), and the California Interagency Wildlife Task Group. For additional information on local species see Section 5.0 (Conservation and Natural Resources).

4.6.1 Environmental Setting

In southern California, coyotes, black bears, mountain lions, rattlesnakes, and to a lesser extent, bobcats, represent common species that are considered nuisance species when moving from the wildlands to the urban interface. In many areas of southern California wildlife interactions between human and domestic animals are becoming more prevalent due to environmental conditions such as drought causing reductions in food and water sources, and wildfires limiting foraging areas and driving animals from wildlands, as well as the draw of easy food sources that urban areas provide. Additionally, behavioral changes in many animals who venture into urban areas are also observed and contribute to the increase in animal encounters from the wild animal normalizing these conditions (i.e., becoming used to and unafraid of humans).

Coyotes are medium-sized members of the dog family, larger than foxes but smaller than wolves. Native to western North America, they are extremely adaptable. Coyotes have increased in numbers and have increased their geographical range during the past fifty years, due in part to human modification of the landscape. Coyotes now are found almost everywhere in North America.

Coyotes can live in almost any habitat in California, from arid deserts in the south to wet meadows and foggy coastal regions in the north. They are not as common in densely forested regions or in agricultural environments planted mainly for annual crops because they find few food resources in these situations. In recent decades they have become more numerous in many suburban environments where an ample food supply is available. Some of the highest population densities on record occur in suburban southern California.

Coyotes normally are elusive animals that avoid contact with humans. Most active after dusk and before daylight, they are typically seen only at a distance. This trait may be a response to hunting, trapping, and other efforts to control coyote predation. Coyotes have been harassed and killed ever since settlers first arrived in western North America with their livestock. In most areas of California, coyotes continue to behave in ways that minimize their contact with humans. Within urban and suburban areas in California, however, some coyotes have adapted to residential neighborhoods, parks, and open spaces, and seemingly have lost their fear of humans. This may be a result of behavioral changes that have occurred over several generations of coyotes, in localities where predator control is no longer practiced. Coyotes thrive in such areas because food, water, and shelter are abundant, and coyotes living in these

environments may come to associate humans with food and protection. Once attracted to suburban areas, they prey on the abundant rodents, rabbits, birds, house cats, and small dogs that live in residential habitats. They also will feed on household garbage, pet food, and seeds and fruits of many garden and landscape plants. In some localities this has resulted in the development of local coyote populations that seemingly ignore people, while a few coyotes have become increasingly aggressive toward humans. Coyotes have been implicated in only one human death in U.S. history – that of a 3-year-old girl in Glendale, California in 1981 (Fox, C.H. and C.M. Papouchis, 2005).

Black bears are the largest terrestrial species in the order Carnivora in California. Adults have few predators other than humans. Distribution of black bears in California are widespread, occurring from sea level to high mountain regions. Found in the North Coast Ranges, Cascades, Sierra Nevada, parts of the South Coast Ranges, and in the San Gabriel and San Bernardino Mountains. Black bear sightings in San Diego County are a rarity and it is generally accepted that black bears have not been seen in the county since 2000, although odd reports periodically come in from widely diverse areas in San Diego County.

The drought in California has killed more than 12 million trees in the forests of southern California, and while many small animals that cannot move have died in place as their habitat shrinks, bears and other big game have simply moved rather than compete for food in a cramped forest area. For many of California's 35,000 black bears, that means venturing into residential neighborhoods, searching for food in garbage and trash. Drought conditions have increasingly brought bears into contact with humans in recent years and officials say they expect these interactions to increase as drought conditions continue to reduce forested land.

Wild cats are large felid carnivores that reside in the Planning Area and include the mountain lion (Puma concolor) and the bobcat (Lynx rufus). Problems associated with mountain lions include their predation upon pets and attacks on humans; bobcats have recently been implicated in southern California for a small number of pet predation instances.

The distribution of prevalence of large cats in California is widespread, but uncommon, ranging from sea level to alpine meadows. Large cats are found in nearly all habitats, except xeric regions of the Mojave and Colorado deserts, and are considered most abundant in riparian areas, and brushy stages of most habitats. Recent studies by the California Department of Fish and Wildlife, and others, suggest that 2,500-5,000, or more, mountain lions currently live in California, and the numbers appear to be increasing. Populations of mountain lions are generally associated closely with deer populations (Nowak, 1976). Fragmentation of habitats by human developments and associated roads, power transmission corridors, and other support facilities, restricts movements and increases association with humans. Figure 4-5 shows mapped mountain lion range within the Planning Area. A majority of the City land area and its SOI are considered mountain lion range areas.

The chance of conflict with wild cats may be reduced by addressing the availability of live food sources (pets and natural prey) and habitat (brush to hide in). Reducing the availability of live natural food sources entails landscaping private properties and public spaces in such ways that these animals' prey are not attracted to the area (Department of Fish and Game, 2004).

Rattlesnakes are found throughout southern California, in a variety of habitats. San Marcos is within the habitat area of the Western Rattlesnake, Speckled Rattlesnake, and the Red Diamond Rattlesnake. The rattlesnake is California's only venomous snake. Snakes help to keep the rodent population in check, and are an important part of the ecosystem. The California Kingsnake, which is also endemic to San Marcos, is a non-venomous snake that is a natural predator of the rattlesnake.

While they are often encountered in the foothills, they have been found in a variety of settings including urban areas, along riverbeds, and in parks and golf courses. Although generally not aggressive, rattlesnakes can strike if threatened. They will generally retreat if given room and not deliberately provoked, but if they are startled, they may strike without warning. On rare occasions, rattlesnake bites have caused injury and even death. Most snake bites occur between April and October when both humans and snakes are most active outdoors. However, those occurrences are rare and the risk of being bitten is small compared to the risk of other environmental injuries.

The California Poison Control System (CPCS) reports that approximately 300 snake bites are reported in California annually. Of the estimated 7,000-8,000 people per year that are bitten by poisonous snakes in the United States, the Centers for Disease Control and Prevention (CDC) reports that only about 5 of those people die from their injuries.

Drought, wildfires, and loss of habitat have all contributed to wildlife habitats shrinking. These activities increasingly push wildlife, including rattlesnakes, into areas inhabited by humans and increase the chance of interaction. Property owners can decrease the likelihood of finding rattlesnakes on their property by building a snake proof fence and removing vegetation, piles of rocks, or boards from around their home. While outdoors, residents can decrease snake bites by sticking to sidewalks or trails, avoiding tall grass or heavy underbrush, and stepping on, not over, large rocks or logs.

4.6.2 References

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4.7 NOISE

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the Planning Area. The analysis in this section was prepared with assistance from MD Acoustics.

4.7.1 Key Terms

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of noise.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 p.m. - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Decibel or dB Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.

Frequency The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.

Impulsive Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

$L_{(n)}$ The sound level exceeded as a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50 percent of the time during the one-hour period.

Loudness A subjective term for the sensation of the magnitude of sound.

Noise Unwanted sound.

SEL A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.

4.7.2 City of San Marcos Noise Regulations

The City of San Marcos outlines noise regulations and standards within the Municipal Code and the Noise Element of the General Plan.

City of San Marcos General Plan

Land use directly affects noise compatibility. Consideration of the sources and recipients of noise early in the land use planning and development process can be an effective way to reduce the impact of noise on the community. Consideration should be given to both reducing noise in severely impacted areas through rehabilitative improvements, through re-use and/or redevelopment, and avoiding potential noise impacts through effective land use planning and design. Future and proposed land uses should be compatible with existing and forecasted future noise levels. Incompatible land use noise generators should incorporate noise attenuation and/or control measures as part of project design to reduce noise levels to an acceptable interior level or lower, as required by state regulations (CCR Title 24) for residential uses.

The Noise Element of the City of San Marcos General Plan includes *Noise and Land Use Compatibility Guidelines for Transportation-Related Noise*. The City's land use compatibility standards shown in Table 4-3, are based first on the General Plan land use designation of the property and secondly on the use of the property. For example, within the Residential land use designation, a multiple-family use exposed to transportation related noise would have an exterior noise standard of 60 dBA CNEL/Ldn. Noise standards for multiple-family and mixed-use land use designations shown in Table 4-4 are higher than those for single-family residential areas reflecting a more urban environment planned for certain areas of the City. The standards shown in Table 4-3 are purposefully general in nature and not every land use type which could be accommodated within each General Plan designation is identified. Application of the noise standards will vary on a case-by-case basis according to location, development type, and associated noise sources.

Applicable goals, policies and implementation measures presented in the Noise Element of the General Plan are presented below:

Goal N-1 Promote a pattern of land uses compatible with current and future noise levels.

- Policy N-1.1: Address the potential for excessive noise levels when making land use planning decisions in accordance with Table 5 Land Use Compatibility Noise Standards.
- Policy N-1.2: Ensure that acceptable noise levels are maintained near noise-sensitive uses.
- Policy N-1.3: Incorporate design features into residential land use projects that can be used to shield residents from excessive noise. Design features may include, but are not limited to: berms, walls, and sound attenuating architectural design and construction methods.
- Policy N-1.4: Require new development projects to provide barriers to reduce noise levels, or provide sufficient spatial buffers to separate excessive noise generating land uses and noise-sensitive land uses.

Table 4-3: Noise Land Use Compatibility Guidelines for Transportation Noise Sources

	Land Use Category	Exterior Noise Level 55 60 65 70 75 80
A	Residential-single family residences, mobile homes, senior/age-restricted housing	
B	Residential-multifamily residences, mixed use (residential/ commercial)	
C	Lodging-hotels, motels	
D2	Schools, churches, hospitals, residential care facility, child care facilities	
E2	Passive recreational parks, nature preserves, contemplative spaces, cemeteries	
F2	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation	
G2	Office/professional government, medical/dental, commercial, retail, laboratories	
H2	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/ repair	
	Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved	
	Conditionally Acceptable - New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate City decision maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.	
	Unacceptable - New construction or development shall not be undertaken	

Source: City of San Marcos General Plan Noise Element Table 7-3, 2012.

Table 4-4: City of San Marcos Noise Standards

1	The exterior noise level standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA Leq (one hour average).
4	For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as a usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7	For noise sensitive land uses where the people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9	For Categories E and F the exterior Nosie level standard shall not exceed the limit defined as "Acceptable" by the City, or an equivalent one-hour noise standard.

Source: City of San Marcos General Plan Noise Element Table 7-4, 2012.

- Policy N-1.5: Require an acoustical study for proposed developments in areas where the existing and projected noise level exceeds or would exceed the Normally Acceptable levels identified in Table 4-3.
- Policy N-1.6: Require the design and construction of buildings to reduce the effect of commercial noise within indoor areas of residential components of the mixed-use development.
- Policy N-1.7: Through site planning techniques, noise reduction features, and enforcement, minimize nonresidential noise impacts on residential uses.
- Policy N-1.8: Ensure residents in mixed-use developments located adjacent to commercial or retail related land uses are notified that they could be affected by noise from adjacent uses.

Goal N-2 Control transportation-related noise from traffic, rail, and aviation sources near noise sensitive land uses.

- Policy N-2.1: Encourage only noise-compatible land uses along existing and future roadways, highways, and freeways.
- Policy N-2.2: Promote coordinated site planning and traffic control measures that reduce traffic noise on noise-sensitive land uses.
- Policy N-2.3: Advocate the use of alternative transportation modes such as walking, bicycling, mass transit, and non-combustible engine vehicles to reduce traffic noise.
- Policy N-2.4: Encourage the installation, maintenance, and renovation of freeway and highway rights-of-way buffers and sound walls through continued cooperation with the California Department of Transportation (Caltrans) and SANDAG.
- Policy N-2.5: Examine the applicability and noise reduction capabilities of cost effective alternative roadway surfaces, such as rubberized asphalt.
- Policy N-2.6: Support noise-compatible land uses along rail corridors.
- Policy N-2.7: Require noise-reducing design features as part of any sensitive use proposed near rail corridors.
- Policy N-2.8: Evaluate the use of wayside horns near areas where rail crossings intersect public roads to reduce noise impacts from train horns.
- Policy N-2.9: Provide input to the San Diego County Airport Authority as appropriate to control airport noise.

Goal N-3 Control non-transportation-related noise from commercial, industrial, construction, and other sources on noise sensitive land uses.

- Policy N-3.1: When adjacent to noise sensitive receptors, require developers and contractors to employ noise reduction techniques during construction and maintenance operations.
- Policy N-3.2: Limit the hours of construction and maintenance operations located adjacent to noise-sensitive land uses.
- Policy N-3.3: Limit the allowable hours of operations and deliveries for commercial, mixed-use, and industrial uses located adjacent to residential areas.
- Policy N-3.4: Avoid excessive noise of commercial and industrial land uses through site and building design features.
- Policy N-3.5: Require industrial land uses to locate vehicular traffic and operations away from adjacent residential areas as much as possible.

City of San Marcos Noise Ordinance

The City of San Marcos Municipal Code contains ordinances that are designed to protect people from non-transportation noise sources such as construction activity; commercial, industrial, and agricultural operations; machine and pumps; amplified sound, and air conditioners. Enforcement of the Code ensures that adjacent properties are not exposed to excessive noise from stationary noise sources. Enforcing the Code includes requiring proposed development projects to show compliance with the Code, including operating in accordance with noise levels and hours of operations limits placed on the project site. The City also requires construction activity to comply with established work schedule limits. The Noise Code also establishes allowable interior and exterior noise levels for residential and commercial areas.

Section 20.300.070 – Performance Standards (Noise)

City of San Marcos regulations aim to prohibit unnecessary, excessive, and annoying noises from all sources, as certain noise levels are detrimental to the health and welfare of individuals. The standards of this section and of Chapter 10.24 Noise of the Municipal Code apply to all land uses in all Zones unless otherwise specified.

Specifically, no person shall create or allow the creation of exterior noise that causes the noise level to exceed the noise standards established by Table 7 (Table 20.300-4 in Section 20.300.070 of the City of San Marcos Municipal Code). Increases in allowable noise levels listed in Table 8 may be permitted in accordance with the standards outlined in Table 7.

Section 20.300.070 also prohibits any person from creating noise that causes the interior noise level when measured within a dwelling unit to exceed forty-five (45) dBA at any time, except as permitted by Table 9 Table 20.300-6 of the City of San Marcos Municipal Code).

Table 4-5: Exterior Noise Standards by Zone

Zone	Allowable Noise Level (dBA Leq) Measured from the Property Line	
	7:00 am to 10:00 pm	10:00 pm to 7:00 am
Single-Family Residential (A, R-1, R-2)[1,2]	60 dBA	50 dBA
Multifamily Residential (R-3)[1,2]	65 dBA	55 dBA
Commercial ((C, O-P. SR)[3]	65 dBA	55 dBA
Industrial	65 dBA	60 dBA
Notes:		
1. For single-family detached dwelling units, the “exterior noise level” is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.		
2. For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.		
3. For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.		
Source: City of San Marcos Municipal Code Table 20.300-4.		

Table 4-6: Permitted Increase in Exterior Noise Levels

Permitted Increase	Duration (Cumulative Minutes per Hour)
5	15
10	5
15	1
20	Less than 1 minute

SOURCE: CITY OF SAN MARCOS MUNICIPAL CODE TABLE 20.300-5.

Table 4-7: Permitted Increase in Interior Noise Levels

Permitted Increase (dBA)	Duration (Cumulative Minutes Per Hour)
5	1
10	Less than 1 minute

Source: City of San Marcos Municipal Code Table 20.300-5.

Section 20.300.070 – Performance Standards (Vibration)

Vibration may disturb the conduct of certain activities and create discomfort for some individuals. To minimize the disturbance and inconvenience from vibrations, the City has required that no person or use shall create, maintain, or cause ground vibration that is discernible without instruments to a person of normal sensitivity at any point on a property that is adjacent to the property of the vibration source. The ground vibration caused by moving vehicles, trains, aircraft, or temporary construction or demolition is exempted.

Section 10.24.010 – Loud, Annoying, and Unnecessary Noise Prohibited

Section 10.24 of the City of San Marcos Municipal Code prohibits any person from making any loud, annoying or unnecessary noise that injures, impairs or endangers the health, peace or safety of any person of reasonable sensibilities, or that disturbs the peace, quiet, comfort or tranquility of the neighborhood or community, or exceeds the noise limits set forth in Section 20.300.070(F) of this Code. The characteristics and conditions that should be considered in determining whether a violation of the provisions of this section exists, include, but are not limited to, the following:

- The level and intensity of the noise;
- Whether the nature of the noise is usual or unusual;
- Whether the origin of the noise is natural or unnatural;
- The level and intensity of background noise;
- The nature and zoning of the area abutting and within which the noise emanates;
- The time of the day or night the noise occurs; and
- Whether the noise is recurrent, intermittent or constant.

City of San Marcos Code Section 10.24.020 also includes noise restrictions for specific sources and/or activities that are not meant to be exclusive or all-inclusive of noise sources that may be in violation of noise standards, including horns and signaling devices, motor vehicle noises, stereos, televisions, loudspeakers, yelling or shouting, animals and birds, sources that impact schools and churches, hawkers and peddlers, erection or demolition of buildings, and late-night disturbances.

4.7.3 Study Method and Procedure

The following section describes the noise modeling procedures and assumptions used for this assessment.

Noise Measurement Procedure and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

MD conducted the sound level measurements in accordance to Federal Highway Transportation (FHWA), Caltrans (TeNS) technical noise specifications and the City's noise ordinance. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA). The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed 5-feet above the ground for all measurements
- Sound level meters were calibrated (Larson Davis CAL 200) before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Results of the long-term noise measurements were recorded on field data sheets
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft flyovers were noted
- Temperature and sky conditions were observed and documented

SoundPLAN Noise Modeling

SoundPLAN (SP) acoustical modeling software was utilized to create existing and future traffic noise level contours for all General Plan designated roadways. Model parameters included average daily traffic volumes, day/evening/nigh split, roadway classification, width, speed and truck mix. Surfaces adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

The Sprinter rail line, operated by North County Transit District (NTCD) currently operates seven days a week. There are approximately 75 trips per each 24-hour period. Rail noise was calculated utilizing the Create Noise Model and output was entered into the SoundPLAN noise model as a line source.

Table 4-8: Road Segment Modeling Assumptions

Roadway	From	To	Existing ADTs	2019 Speed	Vehicle Mix Auto/Medium Truck/Heavy Truck	Day/Evening/ Night Split
Barham Dr	Twin Valley Oaks Rd	Campus Way	11,710	45	95.2/3.1/1.7	75/10/15
Barham Dr	Campus Way	La Moree Rd	14,053	45	95.2/3.1/1.7	75/10/15
Barham Dr	La Moree (W)	RT 78 Off Ramp	17,071	45	95.2/3.1/1.7	75/10/15
Barham Dr	RT 78 Off Ramp	Woodland Pkwy	21,538	45	95.2/3.1/1.7	75/10/15
Barham Dr	Woodland Pkwy	RT 78 On Ramp	16,958	45	95.2/3.1/1.7	75/10/15
Barham Dr	RT 78 On Ramp	Bennett Ave	123,217	45	95.2/3.1/1.7	75/10/15
Bennett Ave	Rock Springs Rd	Knob Hill Rd	6,602	40	95.2/3.1/1.7	75/10/15
Bennett Ave	Knob Hill Rd	Mission Rd	6,953	40	95.2/3.1/1.7	75/10/15
Bent Ave	Grand Ave	San Marcos Blvd	5,120	35	95.2/3.1/1.7	75/10/15
Bent Ave	San Marcos Blvd	Discovery St	10,305	35	95.2/3.1/1.7	75/10/15
Borden Rd	Las Posas Rd	Comet Circle	9,490	35	95.2/3.1/1.7	75/10/15
Borden Rd	Comet Circle	Twin Oaks Valley Rd	13,881	35	95.2/3.1/1.7	75/10/15
Borden Rd	Twin Oaks Valley Rd	Woodward St	11,821	35	95.2/3.1/1.7	75/10/15
Borden Rd	Woodward St	Vineyard Rd	8,303	35	95.2/3.1/1.7	75/10/15
Borden Rd	Vineyard Rd	Mulberry Dr	10,008	35	95.2/3.1/1.7	75/10/15
Borden Rd	Mulberry Dr	Rose Ranch/Richland	11,921	35	95.2/3.1/1.7	75/10/15
Borden Rd	Rose Ranch/Richland	Woodland Pkwy	13,978	35	95.2/3.1/1.7	75/10/15
Craven Rd	Discovery St	Santa Barbara Dr	18,296	45	95.2/3.1/1.7	75/10/15
Craven Rd	Santa Barbara Dr	Twin Oaks Valley Rd	18,845	45	95.2/3.1/1.7	75/10/15
Deer Spring Rd	Twin Valley Oaks Rd	North City Limit	22,354	45	95.2/3.1/1.7	75/10/15
Discovery St	San Marcos Blvd	320' N/O San Pablo Dr	13,133	35	95.2/3.1/1.7	75/10/15
Discovery St	La Sombra Dr	Via Vera Cruz	12,200	35	95.2/3.1/1.7	75/10/15
Discovery St	Via Vera Cruz	Bent Ave	13,038	35	95.2/3.1/1.7	75/10/15
Discovery St	Rush Ave	Twin Oaks Valley Rd	12,250	35	95.2/3.1/1.7	75/10/15

Grand Ave	Rancho Santa Fe Rd	Pacific St	9,676	40	95/3/2	75/10/15
Grand Ave	Pacific St	Las Posas Rd	12,044	40	95/3/2	75/10/15
Grand Ave	Via Vera Cruz	Bent Ave	10,770	40	95.2/3.1/1.7	75/10/15
Grand Ave	Bent Ave	San Marcos Blvd	11,382	40	95.2/3.1/1.7	75/10/15
Grand Ave	San Marcos Blvd	Creekside Rd	9,301	40	95.2/3.1/1.7	75/10/15
Knoll Rd	Mission Rd	Los Vallecitos Blvd	9,888	40	95.2/3.1/1.7	75/10/15
Knoll Rd	Los Vallecitos Blvd	San Marcos Blvd	14,744	40	95.2/3.1/1.7	75/10/15
N Las Posas Rd	Avenida Leon	Borden Rd	4,629	45	95.2/3.1/1.7	75/10/15
N Las Posas Rd	Borden Rd	Avenida Azul	14,196	45	95.2/3.1/1.7	75/10/15
N Las Posas Rd	Avenida Azul	Mission Rd	22,488	45	95/3/2	75/10/15
N Las Posas Rd	SR-78 WB	Grand Ave	38,306	45	95.2/3.1/1.7	75/10/15
N Las Posas Rd	Grand Ave	Linda Vista Dr	15,886	45	95.2/3.1/1.7	75/10/15
N Las Posas Rd	Linda Vista Dr	San Marcos Blvd	10,951	45	95.2/3.1/1.7	75/10/15
Linda Vista Dr (W)	Poinsetta Ave	Tilley Ln	11,592	40	95.2/3.1/1.7	75/10/15
Linda Vista Dr	Hillhaven Dr	Tilley Ln	11,592	40	95.2/3.1/1.7	75/10/15
Linda Vista Dr	Tilley Ln	Rancho Santa Fe Rd	11,714	40	95.2/3.1/1.7	75/10/15
Linda Vista Dr	Rancho Santa Fe Rd	Pacific St	12,458	40	95/3/2	75/10/15
Linda Vista Dr	Pacific St	Las Posas Rd	9,208	40	95/3/2	75/10/15
Linda Vista Dr	Las Posas Rd	Via Vera Cruz	5,796	40	95.2/3.1/1.7	75/10/15
Linda Vista Dr	Via Vera Cruz	Grand Ave	4,084	40	95.2/3.1/1.7	75/10/15
W Mission Rd	Rancho Santa Fe Rd	Los Posas Rd	12,910	40	95.2/3.1/1.7	75/10/15
W Mission Rd	Las Posas Rd	Knoll Rd	17,843	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Knoll Rd	Pico Ave	17,083	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Pico Ave	Woodward/Sm Blvd	14,080	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Woodward/SM Blvd	Mulberry Dr	24,977	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Mulberry Dr	Woodland Pkwy	19,957	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Woodland Pkwy	Bougher Rd	21,255	45	95.2/3.1/1.7	75/10/15
W Mission Rd	Bougher Rd	Bennett Ave/Rancheros	16,858	45	95.2/3.1/1.7	75/10/15

W Mission Rd	Bennett Ave/Rancheros	Barham Dr	17,568	45	95.2/3.1/1.7	75/10/15
Nordahl Rd	Rock Springs Rd	Knob Hill Rd	9,986	35	95.2/3.1/1.7	75/10/15
Nordahl Rd	Knob Hill Rd	Center Dr	14,832	40	95.2/3.1/1.7	75/10/15
Nordahl Rd	Center Dr	Montiel Rd	19,462	40	95.2/3.1/1.7	75/10/15
Rancho Santa Fe Rd	S Santa Fe Ave	SR-78 EB	8,080	40	95/3/2	75/10/15
Rancho Santa Fe Rd	SR-78 EB	Grand Ave	32,068	40	95/3/2	75/10/15
Rancho Santa Fe Rd	Grand Ave	Linda Vista Dr	30,828	40	95/3/2	75/10/15
Rancho Santa Fe Rd	Linda Vista Dr	Security Pl	30,286	45	95/3/2	75/10/15
Rancho Santa Fe Rd	Security Pl	San Marcos Blvd	26,121	45	95/3/2	75/10/15
Rancho Santa Fe Rd	San Marcos Blvd	Lake San Marcos Dr	33,423	45	95/3/2	75/10/15
Rancho Santa Fe Rd	Lake San Marcos Dr	Island Dr	29,275	45	95/3/2	75/10/15
Rancho Santa Fe Rd	Island Dr	Melrose Dr	30,000	45	95/3/2	75/10/15
Rancho Santa Fe Rd	Melrose Dr	San Elijo Rd	28,106	55	95/3/2	75/10/15
Rock Springs Rd	Richland Rd	Woodland Pkwy	3,286	25	95.2/3.1/1.7	75/10/15
Rock Springs Rd	Woodland Pkwy	Bennett Ave	6,698	35	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Business Park Dr	Viewpoint Dr	34,613	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Viewpoint Dr	Rancho Santa Fe Rd	32,937	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Rancho Santa Fe Rd	Discovery St	42,183	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Discovery St	Las Posas Rd	39,837	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Las Posas Rd	S Pacific St	36,340	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	S Pacific St	Via Vera Cruz	32,216	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Via Vera Cruz	Bent Ave	36,537	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Bent Ave	Grand Ave	40,662	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Grand Ave	SR-78 EB	53,790	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	SR-78 EB	Knoll Rd	42,476	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Knoll Rd	Pico Ave	25,948	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Pico Ave	Twin Oaks Valley Rd	25,865	45	95.2/3.1/1.7	75/10/15

San Marcos Blvd	Twin Oaks Valley Rd	Rancheros Dr	23,476	45	95.2/3.1/1.7	75/10/15
San Marcos Blvd	Rancheros Dr	Mission Rd	16,698	45	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	Twin Oaks Valley Rd (N)	Buena Creek Rd	19,928	50	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	Buena Creek Rd	La Cienega Rd	16,241	50	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	La Cienega Rd	Borden Rd	19,237	50	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	Borden Rd	San Marcos Rd	26,499	45	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	San Marcos Blvd	SR-78 WB	41,000	45	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	SR-78 WB TO	Barham Dr	45,143	45	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	Barham Dr	Village Drive S.	22,510	45	95.2/3.1/1.7	75/10/15
Twin Oaks Valley Rd	Village Drive S.	Ledge St	22,437	45	95.2/3.1/1.7	75/10/15
Via Vera Cruz	Grand Ave	San Marcos Blvd	9,654	40	95.2/3.1/1.7	75/10/15
Via Vera Cruz	San Marcos Blvd	Discovery St	4,850	35	95.2/3.1/1.7	75/10/15
Woodland Pkwy	Borden Rd/El Nte Pkwy	Rock Spring Rd	10,280	40	95.2/3.1/1.7	75/10/15
Woodland Pkwy	Rock Springs Rd	Mission Rd	14,761	40	95.2/3.1/1.7	75/10/15
Woodland Pkwy	Mission Rd	Rancheros Dr	18,473	40	95.2/3.1/1.7	75/10/15
Woodland Pkwy	Rancheros Dr	Barham Dr	19,380	40	95.2/3.1/1.7	75/10/15
State Route 78	State Route 15	Melrose Dr	114,000	96.1	96.1/2.7/1.3	75/10/16

Notes: Roadway volumes provided by City of San Marcos Public Works, 2019, Kittleson & Associates March 2020, and Caltrans Operations https://dot.ca.gov/programs/traffic-operations/census

4.7.4 Existing Noise Environment

Noise Sources in the Community

The City of San Marcos is a mix of urbanized and suburban areas, and is subject to numerous noise sources, primarily vehicular traffic on major roadways and rail traffic. The City is also subject to typical urban noise sources such as construction, outdoor business activity, emergency response vehicle sirens, landscaping equipment, trash collection activities, barking dogs, high altitude jet aircraft, and car alarms.

Major noise sources in the City include vehicular traffic on SR-78, and major arterials throughout the City (e.g., Rancho Santa Fe Road, Las Posas Road, Mission Road, San Marcos Boulevard, and Twin Oaks Valley Road). Truck traffic is prevalent on SR-78 and major roadways and generates higher noise levels relative to other vehicle types that travel on local roadways. Train traffic on the North County Transit District Sprinter rail line, which is generally oriented parallel to SR-78, is another major source of noise in the City. Sprinter traffic is limited to daily passenger transit and limited freight traffic.

The nearest airport is the McClellan-Palomar Airport, located approximately 2.1 miles west of the western City limits. The City has a San Diego County Sheriff's Office (SDSO) helipad located on Santar Place at the northern County Sheriff's headquarters. Helicopter operations are minimal and for emergency purposes only. The helipad is located in an industrial/commercial area with no nighttime sensitive receptors located within 1,100 feet. McClellan-Palomar Airport is a general aviation airport located near the intersection of Palomar Airport Road and El Camino Real in the City of Carlsbad. In 2010, McClellan-Palomar Airport adopted and amended their Airport Land Use Compatibility Plan (ALUCP) to provide for the orderly growth of the Airport and promote compatibility with the surrounding land uses.

The City of San Marcos is located entirely outside of the present and future 60 dBA CNEL noise contour for McClellan-Palomar Airport, and therefore, airport operations do not substantially affect the ambient noise environment of San Marcos. However, the City is located in a proposed Noise Impact Notification Area (NINA) for Palomar Airport (SDCRAA 2006). The purpose of the NINA is to establish specific actions and responsibilities of realtors and homeowners to adequately inform prospective home buyers of aviation easement during real estate transactions (SDCRAA 2006).

Palomar Airport currently operates under the Voluntary Noise Abatement Procedures (VNAP) which include voluntary quiet hours for both take-off and landing; quiet hours are 10 PM – 7 AM for jet aircraft, and 12 AM – 6 AM other aircraft (emergency, lifeguard, and law enforcement allowed). Pilots are asked to refrain from taking off and landing during these times. The majority of pilots using the airport adhere to the quiet hours (McClellan-Palomar Airport Noise Fact Sheet). For example, during the month of January 2018:

- There were 13,724 total operations (arrivals or departures for jet and propeller or other aircraft).
- 99.5% of total operations were in voluntary compliance and occurred outside of VNAP quiet hours.
- 0.5% (73 flights) of total operations were not in voluntary compliance and occurred during VNAP quiet hours.

- There were 15 nights without any arrivals and eight nights without any departures during VNAP quiet hours.
- The majority of flights occurring during VNAP quiet hours occurred before 12 AM or after 5 AM
- Between the hours of 12 AM. and 5 AM, there were a total of four departures and nine arrivals.
- All commercial flight departures and arrivals occurred outside of the VNAP quiet hours.

Non-transportation noise sources would include construction projects, industrial areas (primarily located north and south of SR-78), residential and commercial heating, ventilation, and air conditioning (HVAC) systems, loading docks, parking areas, commercial/retail centers, event venues (e.g., sports fields, amphitheaters), and any other miscellaneous sources not associated with transportation.

Noise Measurement Results

Noise monitoring locations were selected based on the nearest sensitive receptors relative to the proposed onsite noise sources. Five long-term 24-hour noise and measurements and 11 short-term noise measurements were conducted at the City to document the existing noise environment. Noise measurement locations are shown in Figure 4-6. A summary of short-term noise measurements is presented in Table 4-9 and a summary of long-term noise measurements is presented in Table 4-10.

Short-Term Noise Measurements

As shown in Table 4-9 ambient noise level ranges between 56.6 dBA Leq to 78.5 dBA Leq throughout the City. Vehicle noise associated with SR-78, the existing rail line and areawide roadways were the primary sources of ambient noise in within the City. Secondary noise sources included typical residential activities and landscaping equipment. A summary of results of is presented in Table 4-9. Table 4-9 also provides estimated CNEL levels for each location based off typical hour-to-hour traffic patterns. Field notes and meter output are provided in Appendix C.

Long-Term Noise Measurements

Long-term noise measurements (24 consecutive hours) were taken in order to document CNEL levels, primarily near SR-78 and the City Hall parking structure. Noise levels ranged between 52.8 dBA CNEL to 73.0 dBA CNEL. Primary noise sources were from vehicle traffic. Table 4-10 also outlines the daytime (7AM to 7PM), evening (7PM to 10PM), and nighttime (10PM to 7AM) Leq levels for each location. These represent the average level over each time period.

Noise Level Contours

Modeled existing noise level contours for General Plan Designated road segments are shown in Figure 4-7; existing noise level contours for SR-78 within the City's Sphere of Influence are shown in Figure 4-8; and existing rail (Sprinter) noise contours are shown in Figure 4-9.

4.7.5 References

MD Acoustics, April 2020. City of San Marcos 2020 General Plan Update Noise Impact Study.

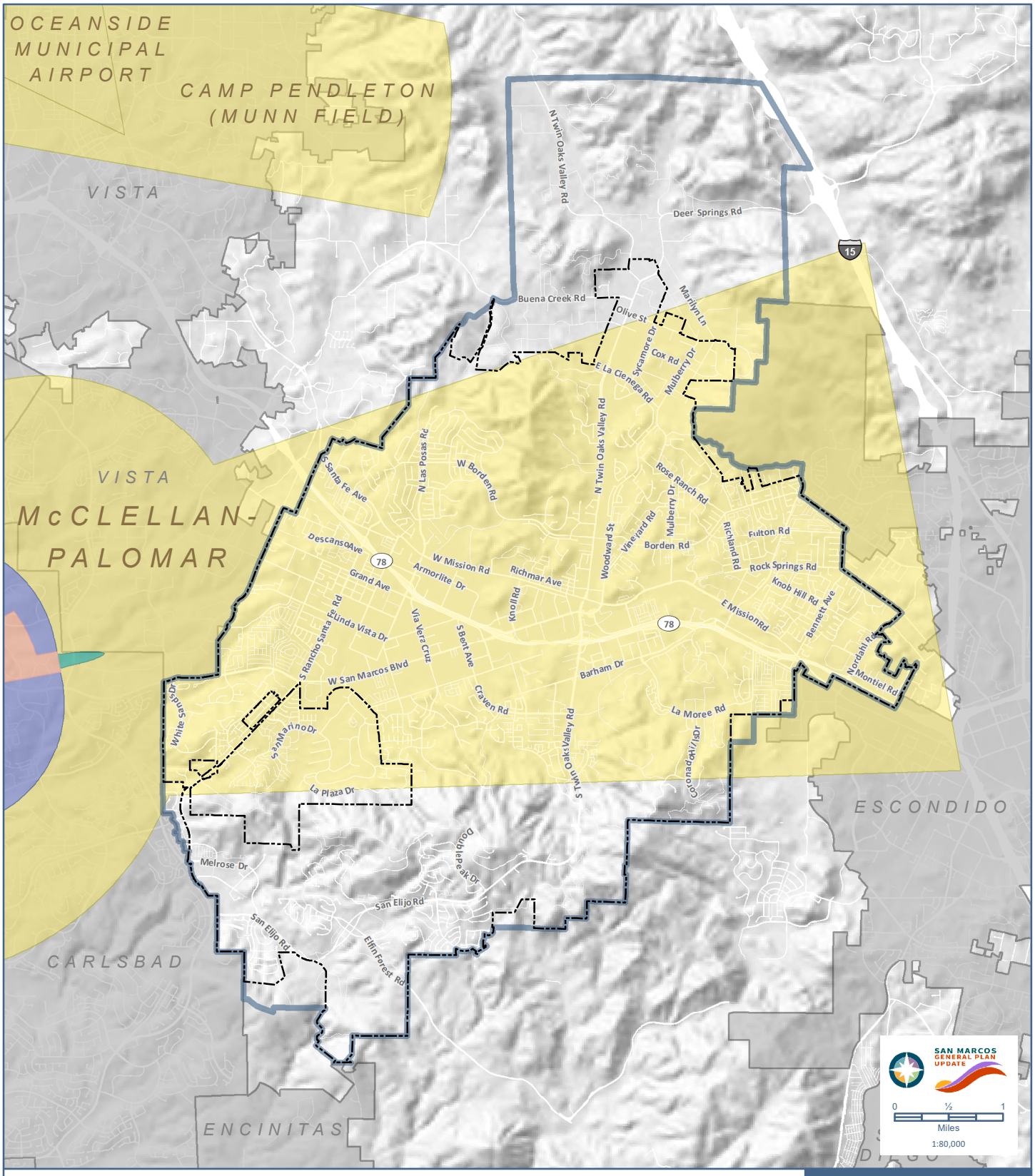
Table 4-9: Short-Term Noise Measurement Summary

Site	Time	Date	Appx Address	Description	A-Weighted Sound Level (dBA)				
					L_{eq}	L_{max}	L_{min}	L_{90}	CNEL
ST1	1:20 PM	2/26/2020	San Elijo Rd & Ledge St	South side of San Elijo Road at Ledge Street	70.9	79.3	55.0	59.8	74.2*
ST2	1:50 PM	2/26/2020	931 Bailey Ct	Mission Sports Park, 75 feet south of Sprinter Line	56.6	67.6	49.4	50.9	59.9*
ST3	3:04 PM	2/26/2020	153 E Carmel St	E. Carmel Street and Campus Way	78.5	87.6	72.2	75.2	80.4*
ST4	3:23 PM	2/26/2020	1566 Grand Ave	Vacant lot next to 1553 Grand Ave., 50 feet south of Grand Ave.	69.0	80.7	55.7	59.6	70.9*
ST5	3:48 PM	2/26/2020	1241 Borden Rd	South side of Borden Road in open space approx. 390 feet east of Amber Drive.	66.8	78.2	54.7	56.0	68.7*
ST6	4:15 PM	2/26/2020	1205 San Marcos Blvd	SW corner of San Marcos Boulevard & Mc Mahr Dr	74.0	89.9	53.7	61.7	74.4*
ST7	4:34 PM	2/26/2020	1306 W Borden Rd	Cerro De Las Posas Park 50 feet west of tennis courts and 50 feet south of Borden Road	67.4	82.5	43.7	48.9	67.8*
ST8	4:59 PM	2/26/2020	Craven & Twin Oaks Valley Rd	Dirt Parking Lot, 50 feet west of Twin Oaks Road	73.9	85.0	55.8	60.4	74.6*
ST9	5:20 PM	2/26/2020	1614 Island Drive	North side of S. Rancho Sante Fe approx. 130 north of Island Drive	72.2	81.0	46.5	54.7	72.9*
ST10	5:54 PM	2/26/2020	906 Nordahl Rd	South side of Nordahl Road, south of Pine Heights Way	68.3	78.4	50.4	55.4	69.0*
ST11	6:12 PM	2/26/2020	Del Roy Dr & Twin Oaks Valley Rd	NE corner of Twin Oaks Valley Road and Del Roy Drive and	73.7	87.8	52.0	55.1	76.2*
Notes:									
** Refers to estimated CNEL*									
dBA = A-weighted decibels									
Leq = equivalent noise level									
Lmax = maximum noise level									
Lmin-minimum noise level									
Ln=noise level exceeded n percent of the measurement period									
ST=Short-Term Noise Measurement (10-Minutes)									
LT=Long-Term Noise Measurement (24-Hours)									

Table 4-10: Long-Term Noise Measurement Summary

Site	Time	Date	Appx Address	Description	A-Weighted Sound Level (dBA)			
					Daytime Leq	Evening Leq	Nighttime Leq	CNEL
LT1	7 AM to 7 AM	2/26-2/27	298 N Rancho Santa Fe Rd	Vacant lot south of Mission Road	46.1	45.6	46.1	52.8
LT2	7 AM to 7 AM	3/12-3/13	750 Furniture Rd	NW corner of SR78 and Vallecitos De Oro	74.5	68.2	62.1	73.6
LT3	7 AM to 7 AM	3/3-3/4	300 Rancheros Dr	Black & Veatch Parking Lot, 100 feet north of SR-78	63.0	60.3	67.4	73.4
LT4	7 AM to 7 AM	2/26-2/27	Mission Rd & Barham Ln	Nordahl Road Rail Station, approx. 100 feet south of Barham Drive	64.1	62.6	61.4	68.6
LT5	10 AM to 10 AM	3/12-3/13	43 Civic Center Dr	Train curve near City Hall parking garage	68.0	62.4	63.5	70.9

Notes:
Leq = Equivalent Noise Level
CNEL = Community Noise Equivalent Level



LEGEND

- City of San Marcos
- Planning Area/Sphere of Influence
- Neighboring City
- Unincorporated San Diego County
- Airport Influence Area 1
- Airport Influence Area 2
- Outer Approach/Departure Zone
- Traffic Pattern Zone

FIGURE 4.1

AIRPORT LAND USE COMPATIBILITY ZONES

Data sources: SANGIS; CalAtlas. Map date: April 14, 2020.

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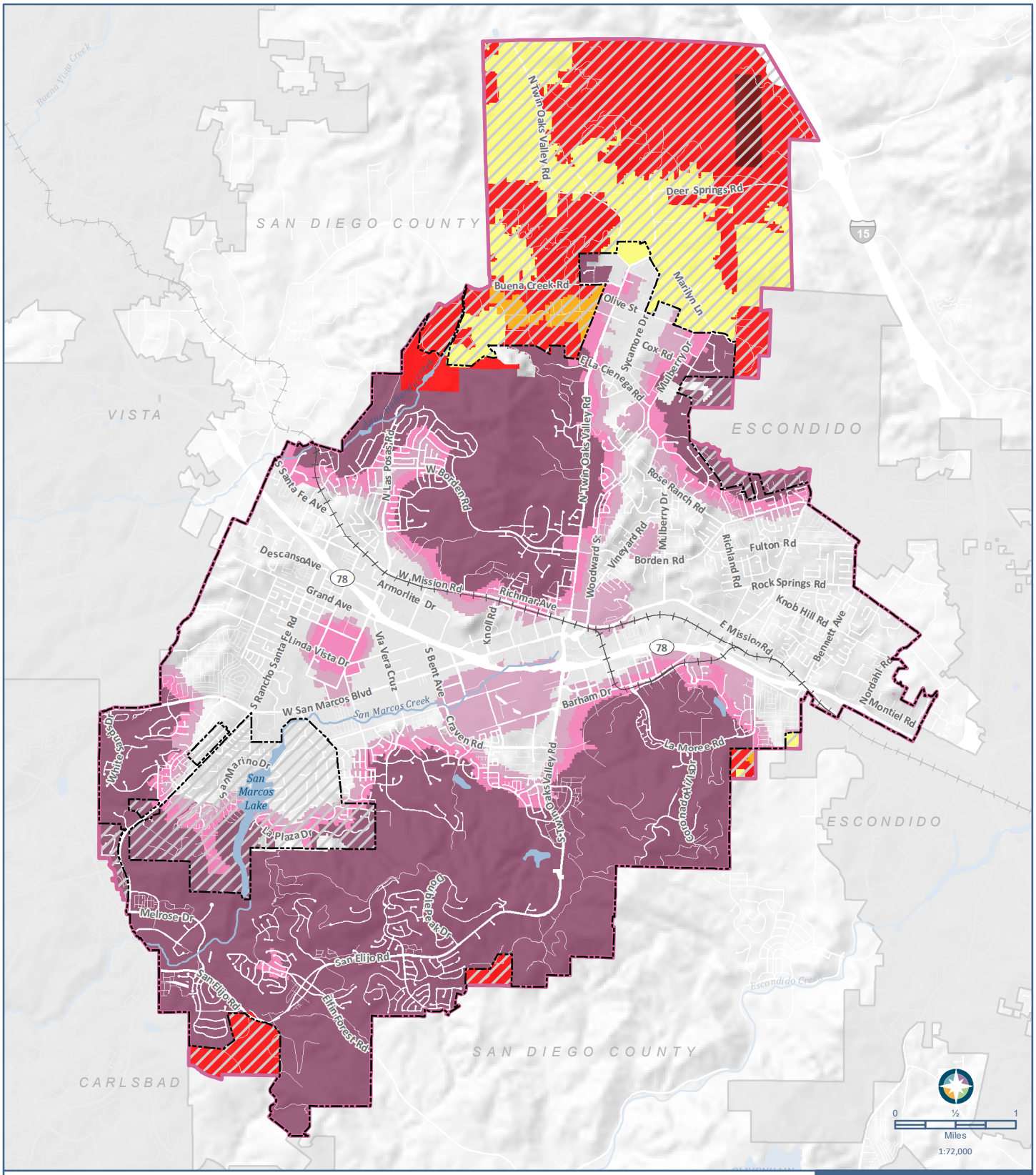

LEGEND

Responsibility Area: Fire Hazard Severity*

- Federal: Very High
- State: Very High
- State: High
- State: Moderate
- Local: Very High
- Local: High
- Local: Moderate

Planning Areas/Jurisdictions

- City of San Marcos
- Sphere of Influence
- Areas within the Sphere of Influence
- Neighboring City

**This dataset does not define the final adopted Very High zones in local responsibility areas. A final adopted version has not yet been published.*

Data sources: FRAP; SANGIS; CalAtlas. Map date: March 11, 2020.

City of San Marcos
General Plan

FIGURE 4.2

FIRE HAZARD SEVERITY ZONES

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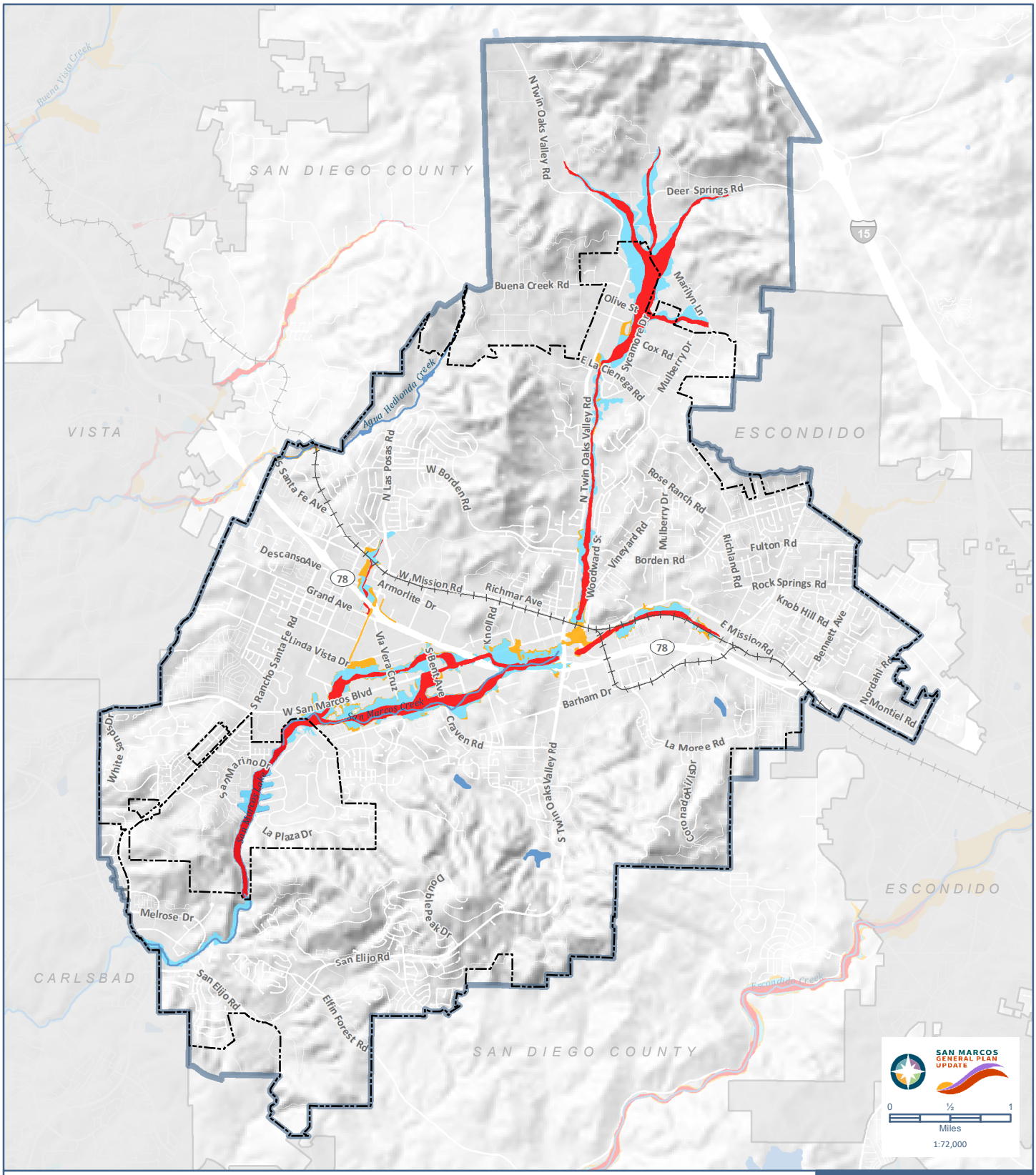

FIGURE 4.3.

FEMA FLOOD MAP

Data sources: FEMA NFHL_06073C, latest effective date 12/20/2019; SANGIS; CalAtlas. Map date: April 15, 2020.

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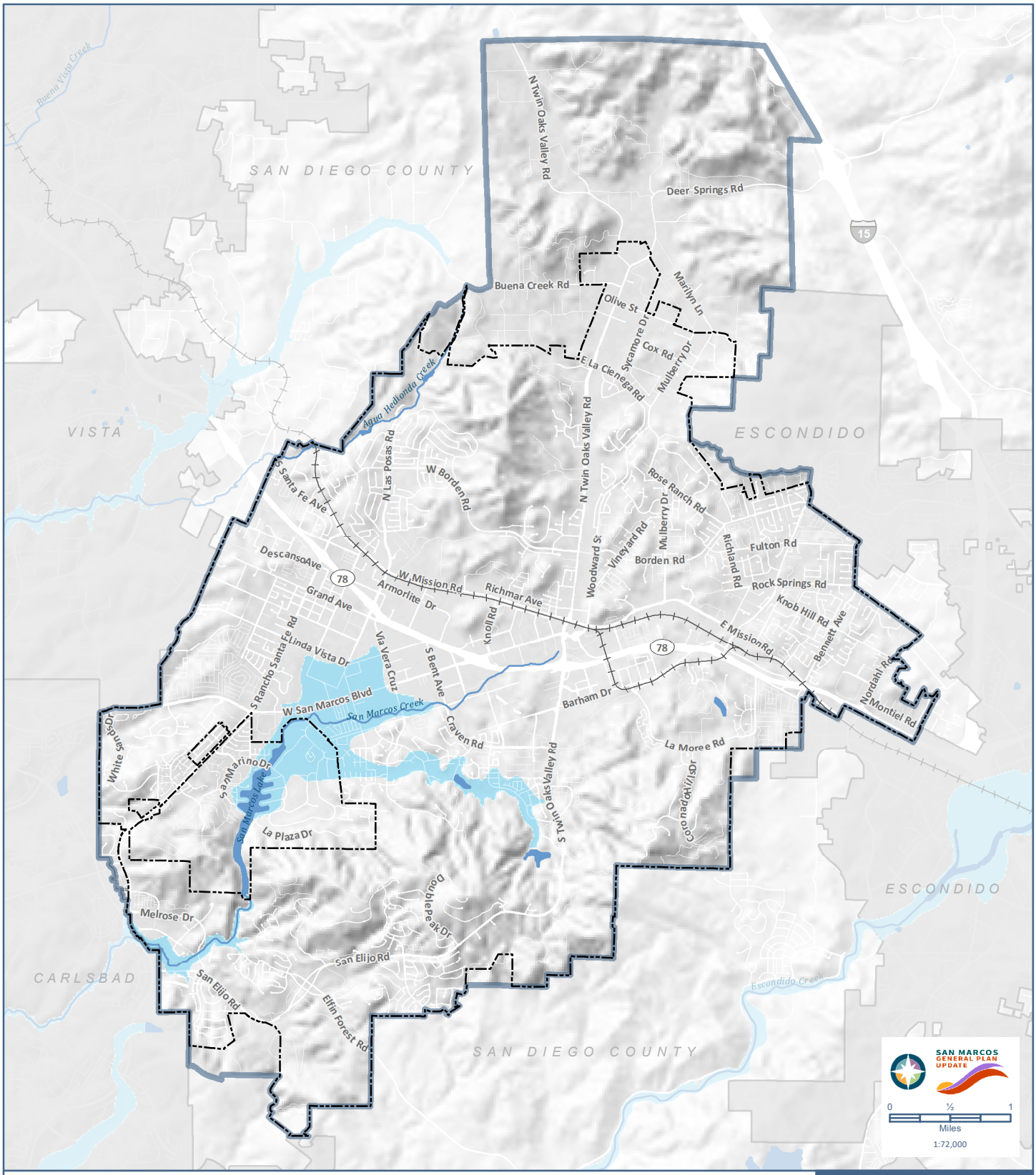

LEGEND

- City of San Marcos
- Planning Area/Sphere of Influence
- Neighboring City
- Unincorporated San Diego County
- Lake or Pond
- Creek
- Railroad
- Dam Inundation Area

FIGURE 4.4.

DAM INUNDATION AREAS

Data sources: oes_services Dam_Inundation map service; SANGIS; CalAtlas. Map date: April 15, 2020.

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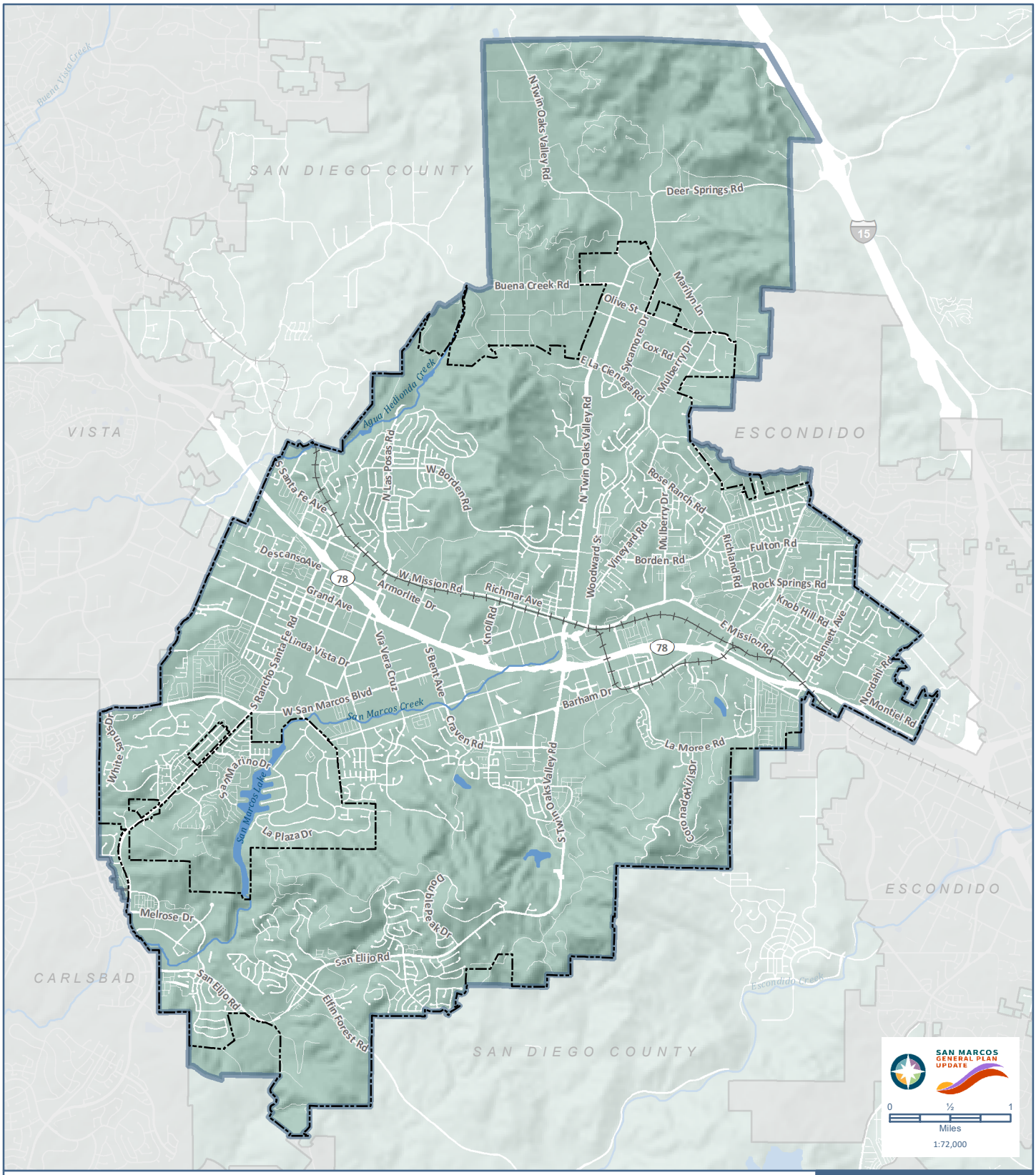

LEGEND

- City of San Marcos
- Planning Area/Sphere of Influence
- Neighboring City
- Unincorporated San Diego County
- Lake or Pond
- Creek
- Railroad
- Mountain Lion Range

FIGURE 4.5

MOUNTAIN LION RANGE

Data sources: California Department of Fish and Wildlife, CWHR2014; SANGIS; CalAtlas. Map date: April 14, 2020.

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= City of San Marcos Boundary

= City of San Marcos Sphere of Influence

1 = Long Term measurement (24-Hour)

1 = Short Term measurement (10-Minute)

Figure 4.6.

Location Measurement Location Map

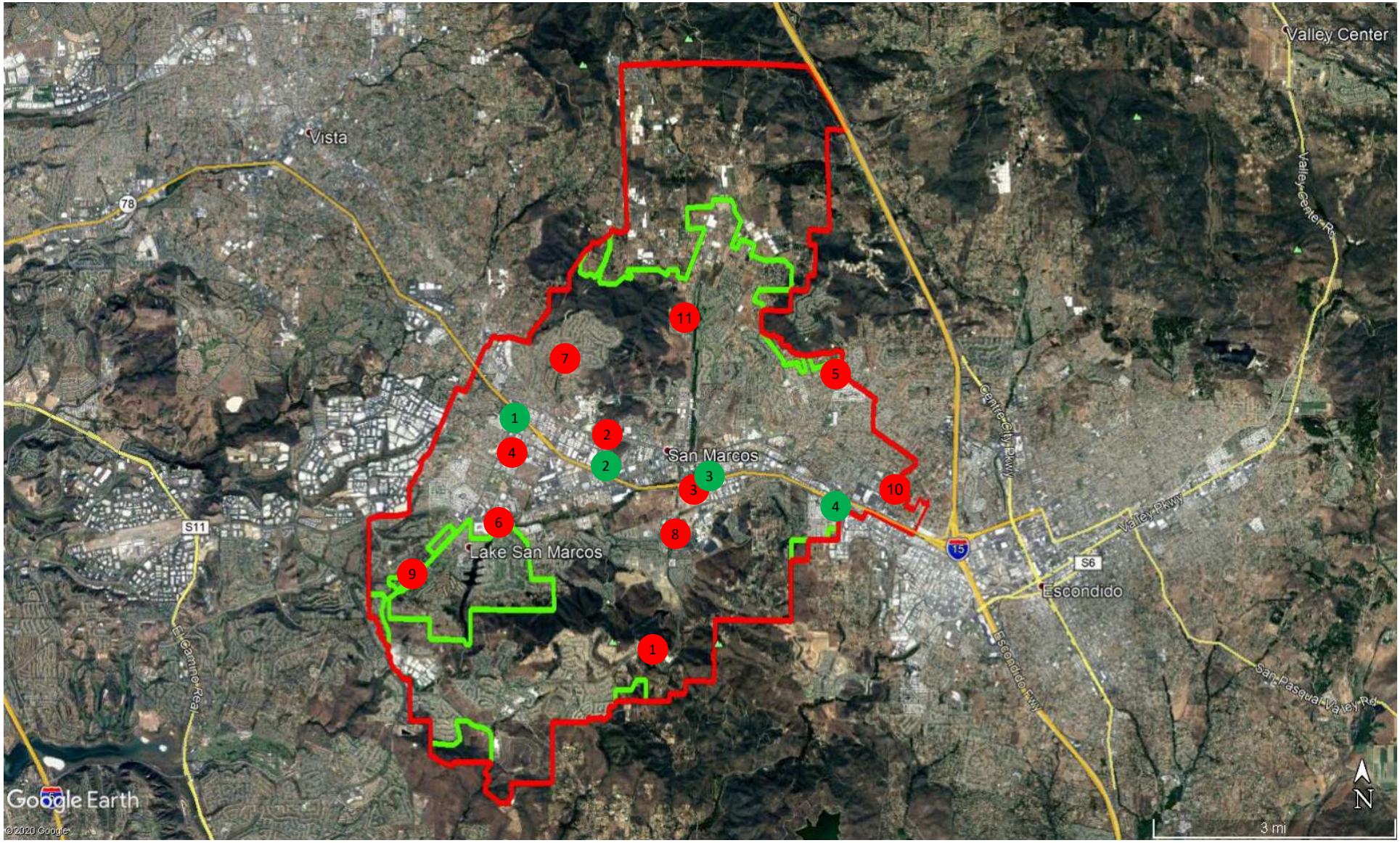

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Figure 4.7.

Existing SR-78 Noise Level Contours – Street Map (CNEL)

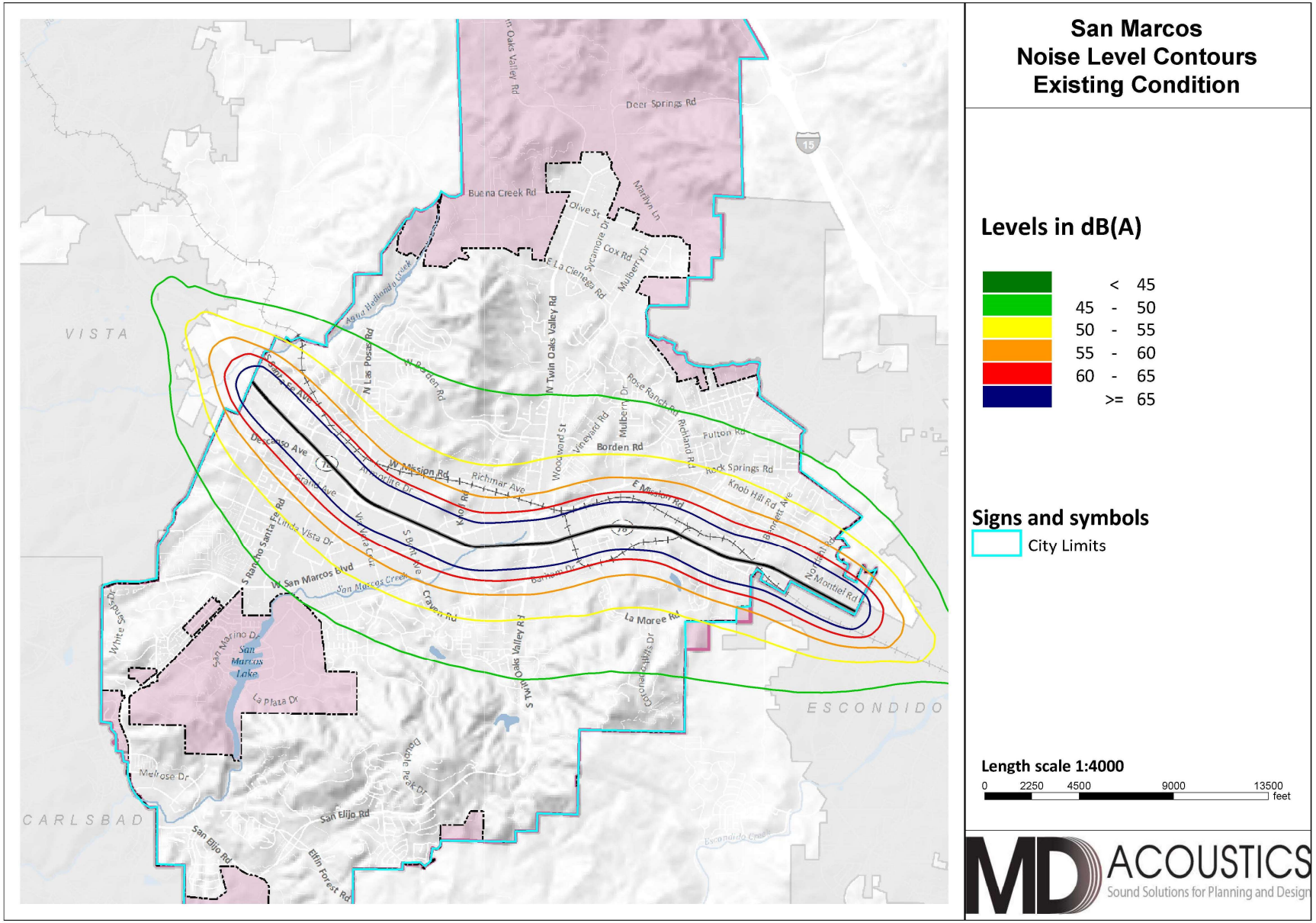

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Figure 4.8.
Existing Roadway Noise Level Contours – Street Map (CNEL)

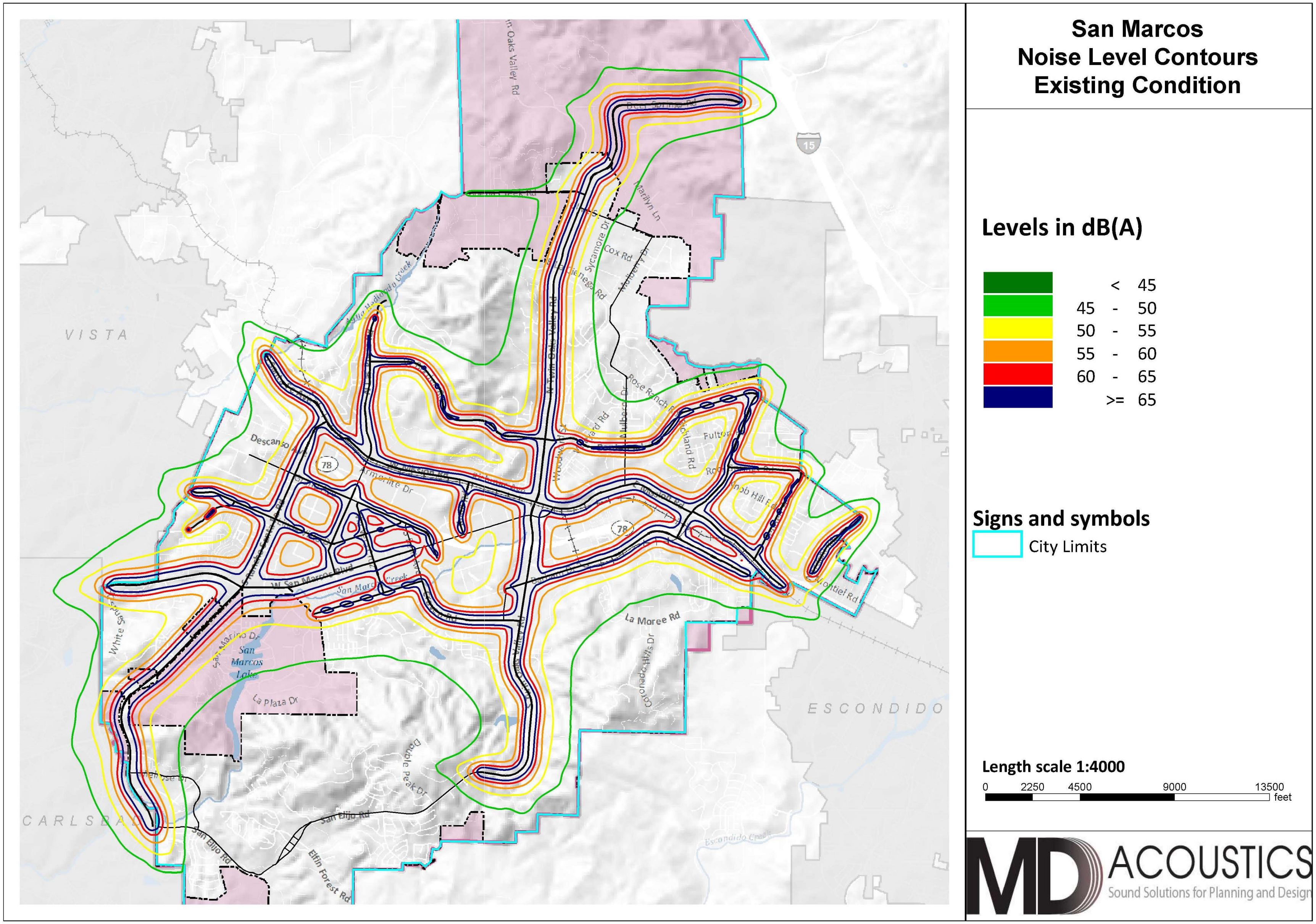

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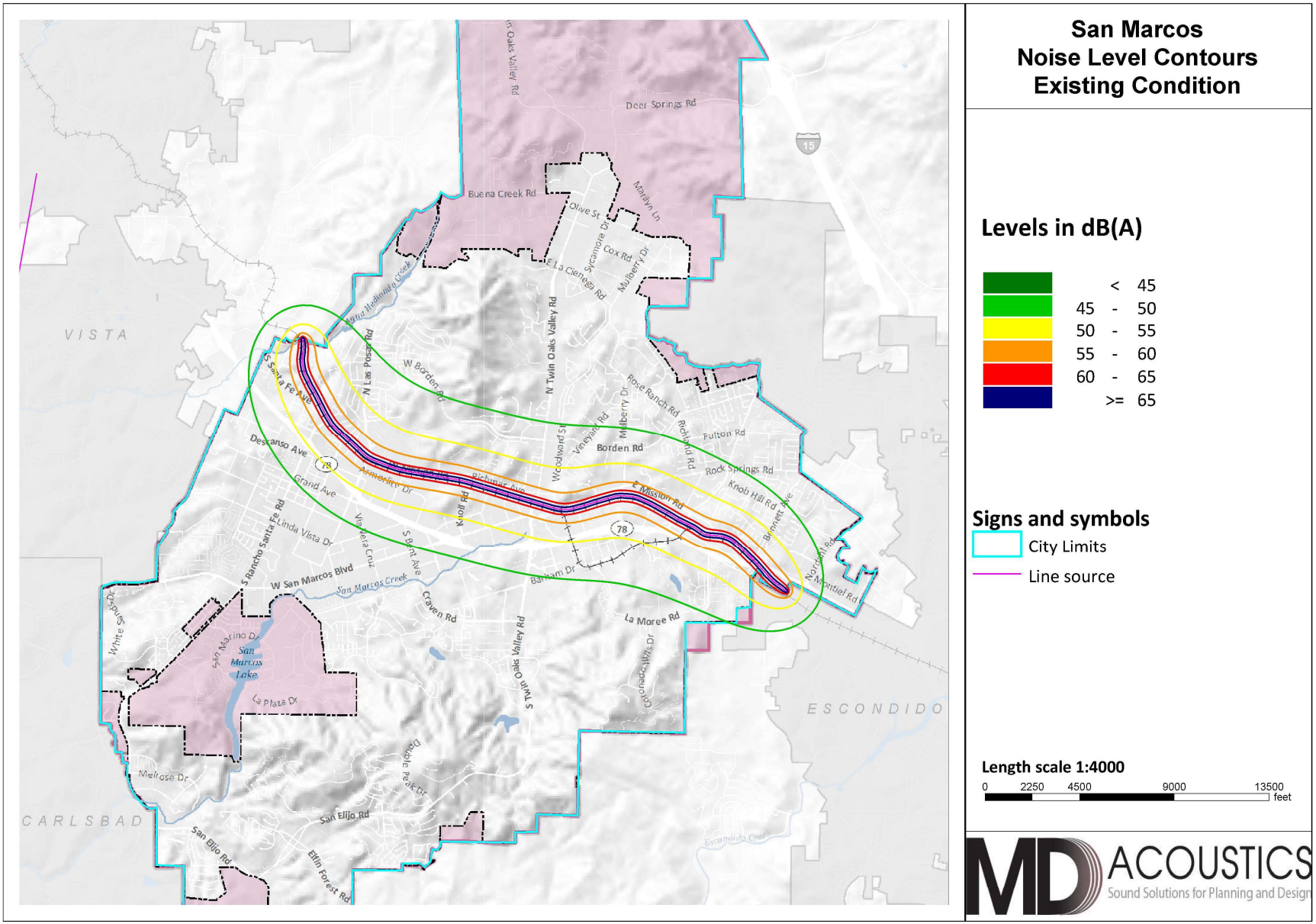
Figure 4.9.

Existing Sprinter Rail Noise Level Contours – Street Map (CNEL)



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