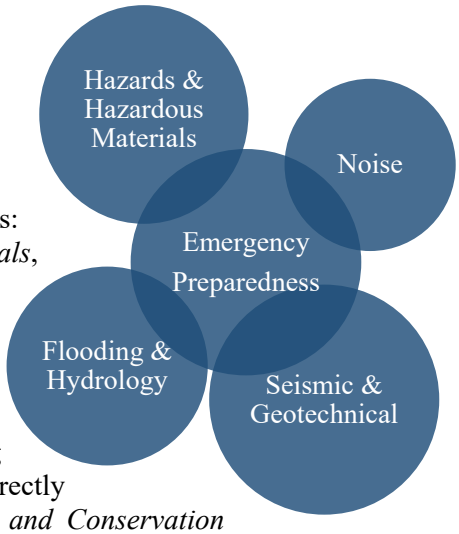
Safety Element

PURPOSE

The Safety Element provides background information, including mapping of environmental hazards, data and analysis that provide guidance for the management of these hazards in the context of community planning and development. The Safety Element informs the planning of land uses and their distribution across the community, and the planning and development of roads, water and sewers, and other infrastructure. The goal of the Safety Element is to reduce the potential short and long-term risk of death, injuries, property damage, and economic and social dislocation resulting from fires, floods, droughts, earthquakes, landslides, and other hazards. Therefore, the purpose of the Safety Element is to ensure that those living, working, shopping and recreating in the community are safe from environmental hazards.

BACKGROUND



The Cathedral City General Plan incorporates an analysis of community health and safety as it related to natural and manmade environmental hazards. These include earthquakes and other geotechnical conditions, flooding threats, wildfire hazards, and community noise. These environmental hazards are discussed in the following individual sub-elements: *Flooding and Hydrology*, *Geotechnical*, *Hazards and Hazardous Materials*, and *Noise*. The Safety Element also includes an *Emergency Preparedness* sub-element that assesses City and regional response planning, coordination and implementation.

The *Safety Element* identifies areas that require special management or regulation because of hazardous or special conditions, including flooding and geotechnical hazard areas (Gov. Code 65560(b)(4)). The element is directly related to topics also mandated in the *Land Use Element*, *Open Space and Conservation Element*, the *Environmental Justice Element*, and the *Air Quality & Climate Stability Element*.

The Safety Element identifies hazards and hazard abatement provisions that guide decisions related to zoning, subdivisions, and entitlement permits. The element also discusses and points to general hazard and risk reduction strategies that complement the Local Hazard Mitigation Plan (LHMP). The element also includes policies for the protection of the community from risks associated with the effects of wildland and urban fires (Gov. Code 65302.6).

Climate change has been identified as one of the greatest threats facing California and the entire planet. It is affecting the hydrologic cycle resulting in extreme conditions ranging from drought to wildfires. Indirect hazards made worse by climate change include over-reliance on groundwater and induced ground subsidence and other manmade geotechnical effects. The State mandates that General Plans include a climate change vulnerability assessment, measures to address vulnerabilities, and comprehensive hazard mitigation and emergency response strategy (Gov. Code 65302(g)(4)). The effects of and policies to address and manage climate change are found in the *Air Quality & Climate Stability Element*.

Safety Element Review

State law requires that each city and county provide a draft of its Safety Element or amendments to the California Geological Survey of the Department of Conservation prior to adoption, for review to determine if all known seismic and other geologic hazards are addressed (Gov. Code 65302.5)(a)). Other state laws and regulations that must be reflected in the General Plan include *100-Year Floodplain Maps* and *Alquist-Priolo Earthquake Fault Zone* mapping.

GENERAL SAFETY ELEMENT GOALS AND POLICIES

Goal 1: City policies and programs that effectively reduce potential short and long-term risk of death, injuries, property damage, and economic and social dislocation resulting from fires, floods, droughts, earthquakes, landslides, and other hazards.

Goal 2: A land use plan and pattern that avoids the placement of people and property at risk from seismic, flooding, wildfires, excessive noise and other environmental hazards.

Goal 3: A City that fully cooperates and coordinates with local and regional emergency services, transportation agencies, public utilities, and other entities providing first responder services during local and regional emergencies.

Policy 1: The City shall promote the enhanced resilience of future water, sewer, electric and other utilities, the retrofit and rehabilitation of existing weak structures and lifeline utilities, and the relocation or strengthening of certain critical facilities to increase public safety and minimize disruption of services.

Policy 2: The City shall ensure to the greatest extent practicable the siting of critical public facilities, including hospital and healthcare facilities, emergency shelters, police and fire stations, and emergency communications, facilities outside 100-year flood plains.

Policy 3: The City shall identify and establish specific travel routes for the transport of hazardous materials and wastes, with key considerations being capacity to safely accommodate additional truck traffic, avoidance of residential areas, and use of interstate or state divided highways as preferred routes.

Policy 4: The City shall work to achieve consistency between the General Plan land use and related policies and the Palm Springs International Airport Land Use Compatibility Plan, as appropriate. Measures may include restrictions on permitted land uses, limitation on the intensity of a use, and such development criteria as height restrictions.

Flooding & Hydrology Sub-Element

PURPOSE

The Flooding and Hydrology Sub-Element provides background information and analysis of local and regional flooding threats that affect the City corporate limits. It includes discussions of related issues and sets forth goals, policies, and programs that address potential flooding and related hydrological hazards within the community. The purpose of this element is to protect the general health, safety and welfare of the community, including people and property, from flood and associated hazards. It references and coordinates with other elements of the General Plan, which also address threats to the lives and property of the community's homes and businesses. The potential for and extent of major future flooding is also evaluated. It is the intention of the community to facilitate, plan and implement the phased development of flood control facilities, both project-specific and Citywide. Provisions for open space and multiple uses, wildlife, and pedestrian and equestrian corridors within major drainages are also planned.

BACKGROUND

Flooding and related hydrological threats and hazards are an essential aspect of the Safety Element, and frequently have a profound effect on the community. Major drainages, including the Whitewater River Stormwater Channel, Whitewater River Floodplain, and the East and West Cathedral Canyon Washes pass through the City. In 2018, there remain major areas of the City where the threat to major flooding is unmitigated.

The Flooding and Hydrology Element is related to several other General Plan Elements, including *Land Use*, *Circulation and Mobility*, *Housing*, *Open Space and Conservation*, *Safety*, *Environmental Justice*, and Hazards and Toxic Materials. Policies and programs set forth in the Land Use Element also have some impact on and are shaped by flooding issues, as they direct the location of open space, essential public facilities, and developed areas, which potentially may be severely damaged by flooding.

California Government Code requires that adjoining jurisdictions plan for regional flood control. In addition, Government Code Section 8401(c) requires that local governments plan, adopt, and enforce flood plain management through land use restrictions when necessary. This legislation, also known as the Cobey-Alquist Flood Plain Management Act, establishes requirements for receiving state financial assistance for flood control measures.

Per Government Code Section 65302(a), the land use element shall identify and annually review those areas covered by the plan that are subject to flooding identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources. California Government Code Section 8589.5 and 65302(g)(2) require the mapping of areas subject to inundation in the event of dam failures.

Regional Climatic and Hydrological Setting

Cathedral City and the Coachella Valley are located within the Colorado sub-unit in the northwestern corner of the Sonoran Desert, and can be characterized as a hot and dry subtropical desert. The valley is bounded by slopes of the San Jacinto, Santa Rosa, San Bernardino and Little San Bernardino Mountains. Mean annual rainfall is very low (2 to 6 inches) on the desert floor and in some years no measurable rainfall has been reported. Most of the rainfall occurs during the cooler months of November through March, but occasional high-intensity thunderstorms and tropical storms occur in late summer and early fall.

Summer daytime temperatures can occasionally exceed 125°F and winter temperatures rarely fall below freezing. The surrounding mountain slopes generally receive rainfall that increases with elevation. The mountains and upper elevations are also generally cooler, with an approximate 5°F drop with every 1,000-foot increase in elevation.

Flooding in the region is generally associated with three different types of storm events: (1) general winter storms, combining high-intensity rainfall and rapid melting of the mountain snowpack; (2) tropical storms out of the southern Pacific Ocean; and (3) summer thunderstorms. Summer storms pose a greater threat of flooding to the valley than winter storms because of their high intensity, short duration rainfall with high volumes of runoff. Major historic and benchmark storm events have generated 6.45 inches of rain in a period of 6 hours.

The Whitewater River Stormwater Channel (WWRSC) is the largest drainage feature within the City and valley. The WWRSC and floodplain is both a unconfined and channelized watercourse that originates from the southerly and easterly slopes of the San Bernardino Mountains. Several of its tributaries originate from the easterly slopes of the San Jacinto and Santa Rosa Mountains, including Cathedral Canyon and Eagle Canyon washes. The Whitewater River eventually discharges to the Salton Sea through the man-made extension of the stormwater channel system known as the Coachella Valley Stormwater Channel (CVSC), extending 22 miles southeast of La Quinta to the north end of the Salton Sea. The drainage area of the WWRSC/CVSC is approximately 1,500 square miles.

Baseline Storm Events

Statistical models based on decades of historic rainfall and runoff data are used to predict and calculate the size of future storms. Benchmark storms and historic data are used by the US Army Corps of Engineers and other flood control agencies and include two distinct storm events that occurred in 1939 and 1979. The 1939 storm event occurred on September 24, was centered over Indio and originated off the west coast of Mexico. This storm generated 6.45 inches of rain in a 6-hour period. The 1979 storm event was due to the Tropical Storm Kathleen, which impacted the area from September 9 through 11 and generated 6.81 inches of rain in the low-lying areas of the central Valley, and as much as 14 inches in the surrounding mountains. The projected 100-year 24-hour storm event in the planning area is 5.42 inches of rain over a 24-hour period.

City Hydrologic Areas

For discussion purposes and based upon their distinctive drainages, the General Plan divides the City into the North and South City Hydrologic Areas. The north area is that generally from 30th Avenue on the south and the city limits on the north. North area drainage is primarily associated with runoff from the Little San Bernardino Mountains and to a lesser degree runoff from the northern portion of the Indio Hills, including Edom Hill. The south area drainage is associated with the WWRSC, which drain hundreds of square miles, to the much smaller East and West Cathedral Canyon Washes and the Eagle Canyon Wash.

South City Hydrologic Area

The South City Hydrologic Area is dominated by the Whitewater Floodplain and WWRSC, which originate northwest of the City and combine with the Morongo Wash flows to pass through the City's west and southern portions. In the upper Whitewater Stormwater Channel 100-year storm flows are calculated to be approximately 47,000 cubic feet per second (cfs) downstream of the confluence of Tahquitz Creek and the Whitewater Channel within the Cathedral Canyon golf course. The Standard Project Flood (SPF) flow at this location is calculated to be 85,000 cfs, a very large volume of water but with a recurrence interval of once every 500± years. The 100-year storm flow is considered the design storm that land use, transportation and other urban improvements should design to accommodate.

This south area is also crossed by the East and West Cathedral Canyon Washes and Eagle Canyon Wash; Eagle Canyon has been dammed to provide a stormwater detention and debris basin and discharges metered flows into the West Cathedral Canyon Evacuation Channel and on to the WWRSC. Inflow rates into the Eagle Canyon Dam in a 100-year storm are estimated at 1,180 cfs. There is no stormwater detention or storage on either the West or East Cathedral Canyon Wash, and their channelized flows discharge directly into the WWRSC.

North City Hydrologic Area

In the northern portion of the City, both north and south of the US Interstate-10/Union Pacific Railroad (I-10/UPRR) corridor, 100-year flooding extends west to east along the corridor. Stormflows in this area are associated with the Morongo Wash watershed that emanates from the north and west, Long Canyon Wash due north of the City, East and West Wide Canyons to the northeast, and Willow Hole. Flat Top Mountain forms Seven Palms Valley to the north and partly blocks drainage from Long and East and West Wide Canyons flowing toward the valley floor. Willow Hole, the low-lying gap between Flat Top Mountain and Edom Hill, is a channel eroded through the Indio Hills that has been displaced from its original position by fault movement. In a word, this drainage area and its geology are complex, and is an area where drainage facilities may be required to ensure future all-weather access.

The City's North Hydrologic Area is also especially susceptible to late-summer, high-intensity thunderstorms such as the 1977 storm north of the City that generated 4.5 inches of rainfall in 1.5 hours and flooded Willow Hole and Thousand Palms. CVWD estimates that peak flows out of Willow Hole of 420 cfs (NHC 2014). Morongo Wash and Long Canyon Wash discharges were estimated to be less than 12,200 cfs resulting from intense 1991 storms.

The general pattern for Morongo Wash floods is to cross Varner Road, then flow towards the I-10 culverts. Flows that pass beneath (or over) I-10 then combine between the I-10 and UPRR and flow southeast between the two raised grades. The flows pond at Date Palm, where they overtop the UPRR to the south; some flow continues towards Thousand Palms.

Long Canyon storm flows occupy multiple flow paths on the alluvial fan upslope of Willow Hole and the Banning Fault escarpments. Flows on the west side of the fan appear to head directly to Morongo Wash. Flows on the east side travel south towards Seven Palms Valley where they may pond before diverting west to Morongo Wash and to a lesser extent east to Willow Hole. Floods from Wide Canyon Dam appear to follow a similar pattern, flowing in multiple channels before joining with Long Canyon flows near Seven Palms Valley.

Most previous studies had assumed that Wide Canyon and part of the Long Canyon floods reached the Coachella Valley through Willow Hole. Post-flood aerial photos appear to indicate that most of these flows travel west towards Morongo Wash. However, flow patterns during extreme floods are not shown on the aerials and they remain somewhat uncertain. Also, erosion and deposition on the alluvial fan surfaces or construction of roads and other urban features may alter these patterns.

Storm Centering	*100-Year Peak Flows (cfs)*		
	Morongo Wash	*Long Canyon*	*Combined*
Long Canyon with contemporaneous rainfall on Morongo Wash	12,500	9,400	21,900
Morongo Wash with contemporaneous rainfall on Long Canyon	19,300	4,400	23,700
Centered over combined Morongo Wash and Long Canyon	16,200	6,500	22,700

REGIONAL FLOOD MANAGEMENT

The City has been building new and expanding existing bridges and other infrastructure along and across the WWRSC and East Cathedral Canyon Wash, ensuring all-weather access during a major storm event. In addition to flooding hazards associated with the WWRSC and the various washes emanating from the Santa Rosa Mountains, the City has been studying management options for drainages in the North City Hydrologic Area. In addition to flood flows, minor flooding and ponding of surface water also occurs on the relatively flat valley floor when flood control channels draining Cathedral Canyon (the East, West and North Cathedral Channels) overflow.

The Coachella Valley Water District (CVWD) and the Riverside County Flood Control District (RCFCD) are responsible for the management of regional drainage within and in the vicinity of Cathedral City, including rivers, major streams and their tributaries, and areas of significant sheet flooding. Both Districts are empowered with broad management functions, including flood control planning and construction of drainage improvements for regional flood control facilities, as well as watershed and watercourse protection related to those facilities.

Flood control facilities within the planning area are categorized as: regional and local control facilities. There are four watersheds which affect the City's flood control. Each of these is briefly described below:

I-10 North Watershed

The Big and Little Morongo Creeks drain the western portions of the Little San Bernardino Mountains. Big and Little Morongo Washes join south of Pierson Boulevard in Desert Hot Springs to form Morongo Wash, which enters the General Plan area as a wide braided network of washes approximately 3/4 mile wide. Flows from the Long Canyon Wash join Morongo Wash near 20th Avenue and Palm Drive about 1 mile north of the General Plan planning area. A Banning fault scarp directs much of the Long Canyon flows west to Palm Drive.

South of 20th Avenue, the Morongo Wash flows due south and crosses I-10 and the railroad right of way, through three bridges and small culverts, where a portion of the flows join the Whitewater River. A major portion of these flows continue in a southeasterly direction between I-10 and the railroad tracks, to the Date Palm Drive overpass, where flows are impounded and are forced southerly, across the railroad tracks and into the Vista Chino/Date Palm Drive intersection during large storm event. Flows from the Long Canyon Wash also pass through Willow Hole, cross Date Palm Drive north of I-10, then flow between I-10 and Varner Road in a southeasterly direction to Thousand Palms and I-10, east of the planning area.

Since 1994, CVWD has been working with the US Army Corps of Engineers (USACE) on the Thousand Palms Flood Control Project. This project consists of a series of flood control improvements designed to meet the Federal Emergency Management Agency (FEMA) 0.01 chance, or 100-year, flood event thereby providing flood protection for existing and planned development areas north of I-10 between Rio Del Sol Road and Washington Street (approximately 2,800 acres).[1]

[1] CVWD Website Updates-Thousand Palms Flood Control Project Accessed March 05, 2018.

I-10 to Whitewater River Watershed

This watershed is bounded on the north by I-10, and on the west and south by the Whitewater River and covers most of the valley floor. Floodwaters from the Morongo Wash, Long Canyon and East and West Wide Canyons combine and flow southeast along the I-10 and UPRR corridor to enter the valley floor. Once on the valley bottom, they are referred to as the "riverine flows."

This area of the City is the most rapidly growing in terms of new development. Levees along the Whitewater River, as well as concrete armoring on its east (left) bank, protect development to the east, in the City. Areas of special concern within this watershed includes the following with poorly defined drainage areas and subject to impacts from nuisance flows. Most flood water in this watershed is conveyed within existing City streets.

- area bounded by McCallum Way, Avenida Maravilla, and Vista Chino
- area within the City bounded by Date Palm Drive, Ramon Road and Tortuga
- intersection of Vista Chino and Landau Boulevard
- Dinah Shore Drive between Date Palm and Cathedral Canyon
- Gerald Ford at Plumley

CVWD has built several regional stormwater facilities in the Coachella Valley to protect the planning area and the surrounding lands. These facilities include flood channels or "greenbelts" built in the Cathedral Canyon Golf Course, and elsewhere. The Thousand Palms Flood Control Project would collect stormwater from the Thousand Palms Watershed by intercepting flood flows with a series of levees on the fans uphill from community of Thousand Palms and conveying them through southeast to a new channel to Sun City west of Washington Street.2 For the future, CVWD is coordinating with RCFCD to plan and construct facilities to manage floodwaters from the Morongo Wash Watershed and the riverine flows under the assumption that other regional projects will also be completed.

Eagle Canyon Watershed and Dam

This watershed is located west of the West Cathedral Canyon Channel, and south of Palm Canyon Wash. During periods of heavy rainfall, rain, mud and debris were funneled down Eagle Canyon and damaged structures along East Palm Canyon Drive and northward. The July 20, 2008 storm discharged a large volume of storm flows heavy in sediment, flooding a mobile home park and an auto dealership, along with other businesses. In November 2015, the Eagle Canyon Dam was built to secure the western City from the canyon's repeated damaging flash flooding affects.3

Cove Area Watershed

This watershed is bounded by the Cathedral Canyon Channel East and West, and the Whitewater River. The East and West channels convey flood waters on either side of the Cove, and discharge into the Whitewater River. A number of culverts have been constructed through the channel levees to convey flows from the Cove residential neighborhoods to the channels.

2 North Cathedral City and Thousand Palms Stormwater Management Plan, prepared by Northwest Hydraulic Consultants (2014)

3 Zone 6 Report to the Zone Commissioners by Jason Uhley, General Manager-Chief Engineer (2017)

LOCAL FLOOD MANAGEMENT

Cathedral City Regulation of Local Drainage

While CVWD and the County, working in close cooperation and coordination with the City, have the primary responsibility for regional facilities, it is the City that remains directly responsible for the management of local drainage. The effectiveness with which the City and Districts manage drainage issues will have a direct effect on the scale, complexity and cost of future flood control facilities. The cost-effectiveness of prevention and on-site management should be actively integrated into community land use planning and regulation, recognizing significant physical and financial constraints in many areas of the city.

FEMA AND THE FEDERAL FLOOD RATE MAPS

Exhibit S-1 depicts the general location of the FEMA flood hazard areas throughout the planning area. Flood Hazard Areas are those areas which have statistical chance of flooding once in 100 years or which have a 1% chance of occurring in any given year. The flood hazard mapping also depicts areas subject to flooding in a 500-year storm event, which CVWD defines as the Standard Project Flood (SPF), which has 0.2% chance of occurring in any given year.

The FEMA mapping for the Cathedral City planning area depicts limited areas near and adjacent to the Santa Rosa foothills, and tributary drainage from the west, that are subject to 100-year flooding with depths of between one and three feet and areas with an undetermined flood depth. With completion of the Eagle Canyon Dam, much of the southwest portion of the City that was subject to 100-year flood has been removed from this threat. The City is coordinating with Palm Springs Public Works to address the remaining flooding hazards in this area, which are contributed to by local runoff from both cities.

Exhibit S-1 is not intended to be used to locate parcel- specific sites in relation to Flood Hazard Areas, but to convey the general extent and location of such areas. The delineation of the 100-year flood zone in the area east of Date Palm Drive and south of Interstate-10 is based on CVWD-sponsored hydraulic analysis and mapping prepared by Northwest Hydraulic Consultants. Development planning and engineering in areas subject or potentially subject to flooding should rely upon FEMA maps, consultation with responsible flood control agencies, and site-specific hydraulic analysis.

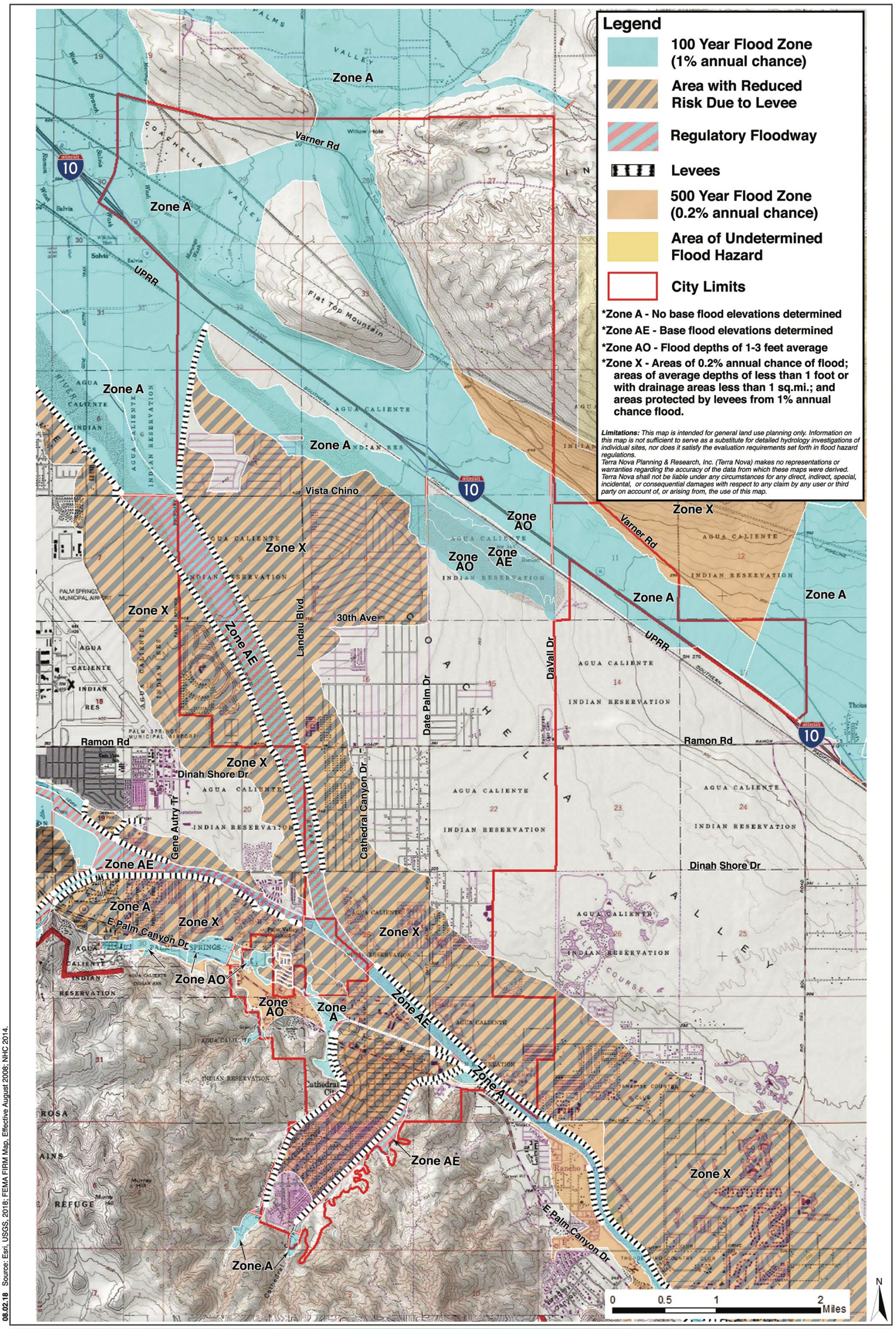


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Exhibit S-1 - FEMA Flood Zones in the Planning Area
Cathedral City 2040 General Plan

Cathedral City

Cathedral City Comprehensive Storm Drain Master Plan

The current Cathedral City Comprehensive Storm Drain Master Plan, prepared in March 1990, is a strategy for the construction, maintenance and funding of storm drain improvements in the City for all four watersheds. The Plan analysis includes coordination with the plans of other agencies having jurisdiction, including the RCFCD and CVWD. Comprehensive planning between the two agencies and the City is ongoing, and includes planning efforts to manage drainage in the northwest and Thousand Palms areas north of US I-10.

Ultimately, the coordinated update of the City's Storm Drain Master Plan and those of the two District will result in a comprehensive approach and strategy to protect lives and property in the City from flood waters. The Storm Drain Master Plan is implemented by City ordinance *Chapter 15.10: Storm Water Management and Discharge Controls* and serves as the operational tool for technical guidelines and developer requirements regarding on-site stormwater retention and other specifics.

Whitewater River Channel

The Whitewater River Channel is the main drainage facility in the city and the Coachella Valley. At Cathedral City, the Whitewater River drains approximately 720 square miles, and generates 100-year storm flows of approximately 47,000 cubic feet per second (cfs) downstream of the confluence of Tahquitz Creek and the Whitewater Channel within the Cathedral Canyon golf course. The Standard Project Flood (SPF) flow at this location is calculated to be 85,000 cfs, a very large volume of water but with a recurrence interval of once every 500± years. CVWD and RCFCD are continuing programs of channel revetment (concrete armoring of channel walls) to protect the channel from stormwater erosion.

CATHEDRAL CANYON DRAINAGE

The Cathedral Canyon drainage originates in the Santa Rosa Mountains and foothills that embrace and form the Cathedral Cove neighborhood. The principal drainages in this area are West and East Cathedral Canyon Washes, but side drainages to the west and east also make important contributions to storm flows that are ultimately discharged into the WWRSC. Significant capital investments have been made in the community where these threats occur, including the revetment discussed above. Improvements have been completed over a long period of time, and in the case of the West and East Cathedral Canyon Channels, date back to 1950. The two major Cathedral Canyon drainages are briefly described below.

East Cathedral Canyon Channel

The East Cathedral Canyon Channel flows north east from the mouth of the steep-walled East Cathedral Canyon and is contained by the Santa Rosa foothills on the east and a RCFCD levee on the west. Portions of the channel were originally lined by the County prior the City's incorporation, with additional lining in 1999 at the East Palm Canyon Drive bridge. This drainage discharges direct into the WWRSC immediately west of Palm Springs Motors.

West Cathedral Canyon Channel

The West Cathedral Canyon Channel flows from the mouth of West Cathedral Canyon along the west boundary of Cathedral Cove and is contained by the Santa Rosa foothills on the west and the RCFCD levee on the east. The channel conveys flows under East Palm Canyon Drive and transitions into the full-lined West Cathedral Canyon Evacuation Channel, which turns east, picks up metered flows from the Eagle Canyon Dam and continues east, passing beneath Date Palm Drive and discharging into the WWRSC.

OTHER LOCAL DRAINAGES AND FACILITIES

A small storm drain is located at Landau Boulevard and Ramon Road, which conveys local runoff into the WWRSC. Another, Line 1, is located southeast of Rio del Sol but has not yet been completed. The City's Storm Drain Master Plan includes a number of detention and retention basins, storm drain pipelines south of I-10 and north of the Whitewater River, and several improvements in Cathedral Cove.

The City, CVWD and the UPRR are also working on the design of a railroad bridge and training levee along the Morongo Wash drainage south of Interstate 10, which will remove a portion of lands to the east from Flood Zone "A" north of Verona Road. The Cathedral City Comprehensive Storm Drain Master Plan (1990) presents proposed drainage systems, conceptual design, and cost estimates and financial analysis for funding strategies for future implementation.

FUTURE DIRECTIONS

Cathedral City is responsible for coordination with the appropriate agencies in the identification of hydrological issues and flood risks within its boundaries, and enforces and implements the City's Storm Drain Master Plan. This sub-element includes goals, policies and programs to help the City and the community assure proper flood management.

GOAL, POLICIES AND PROGRAMS

Goal 1: The protection of lives and property from local and regional flooding hazards.

Policy 1: Update the City Storm Drain Master Plan to reflect new hydraulic analysis, built facilities, changing conditions and the evolving needs of the City.

Program1.A: Local regulations and guidelines shall be established and updated consistent with the Storm Drain Master Plan to direct the management of runoff and provide for local drainage facilities which support the effective use of local and regional facilities.
Responsible Agencies: Public Works; Engineering
Schedule: Continuous

Program 1.B: Monitor and periodically update the Storm Drain Master Plan, in coordination with the County and CVWD, to reflect changes in local and regional drainage and flood conditions.
Responsible Agencies: Public Works; Engineering; RCFCD, CVWD
Schedule: Continuous

Policy 2: Major drainage facilities shall be designed to maximize their use as multi-purpose recreational or open space areas, consistent with the functional requirements of these facilities.

Program 2.A: Coordinate and cooperate with responsible regional agencies in multi-use agreements within flood control channels and designing safe, attractive recreational facilities while maintaining the functional requirements of the drainage facilities.
Responsible Agencies: Public Works; Planning; CVWD, RCFCD
Schedule: Continuous

Program 2.B: Work closely with responsible agencies to design drainage and flood control facilities that minimize negative aesthetic impacts, blend with surrounding lands, and retain natural groundcover and vegetation to the greatest extent practicable.
Responsible Agencies: Public Works; Planning; CVWD; RCFCD
Schedule: Continuous

Policy 3: Continue to actively participate in regional flood control and drainage improvement efforts to develop and implement mutually beneficial drainage plans.

Program 3.A: Capital Improvement Plans for drainage management and control shall be developed, updated and maintained and shall be based upon the Storm Drain Master Plan project descriptions.
Responsible Agencies: Public Works, Planning
Schedule: Continuous

Program 3.B: Coordinate and cooperate with responsible regional agencies in achieving multi-use agreements within flood control channels and designing safe, attractive recreational facilities which maintain the functional requirements of the drainage facilities.
Responsible Agencies: Public Works, Planning, CVWD, RCFCD
Schedule: Continuous

Policy 4: The City shall cooperate with CVWD and RCFCD in securing FEMA map amendments for planning areas and projects, as they occur.

Program 4.A: The City shall coordinate and cooperate in the filing of appropriate FEMA application materials to secure amendments to the Flood Insurance Rate Maps for the City, consistent with existing and proposed improvements.
Responsible Agencies: Public Works; Engineering; CVWD; RCFCD
Schedule: Continuous

Policy 5: Pursue all viable sources of funding for local and regional drainage improvements needed for adequate flood control and protection.

Program 5.A: Consider the establishment of Area Drainage Plans or Assessment Districts to fund drainage improvements.
Responsible Agencies: Public Works; Engineering
Schedule: Continuous

Program 5.B: Explore and pursue County funding, state funding under the Cobey-Alquist Flood Plain Management Act, other State programs, and federal funding options for local and area-wide flood control projects.
Responsible Agencies: Public Works; Engineering
Schedule: Continuous

Policy 6: All new development shall be required to incorporated adequate flood mitigation measures, such as grading that prevents adverse drainage impacts to adjacent properties, on-site retention of runoff, and the adequate siting and sizing of structures located within flood plains.

Program 6.A: Stormwater retention for the 100-year storm shall be enforced through the development review process and routine site inspection.
Responsible Agencies: Public Works; Planning
Schedule: Continuous

Policy 7: Assure adequate, safe, all-weather and low-flow crossings over flood control channels are provided where necessary, and are maintained for passage during major storm events.

Policy 8: Investigate the need for the construction of curbs and gutters in neighborhoods lacking sufficient street drainage improvements.

Policy 9: Critical health and safety facilities shall not be located within the 100-year flood plain unless flood-proofing or other mitigation measures are implemented.

Program 9.A: The Land Use Map and Zoning regulations shall prohibit the construction of critical facilities within the 100-year flood plain unless flood-proofing or other mitigation measures are implemented, and shall only permit residential development if adequate flood-proofing measures have been implemented.
Responsible Agencies: Planning; Public Works
Schedule: Continuous

Policy 10: The flood-prone areas designated on Exhibit S-1 and as defined by FEMA shall be considered inappropriate for conventional urban development without adequate flood control facilities. Applications for development at urban or suburban densities in areas where there is a serious risk to life shall demonstrate appropriate and cost-effective solutions before City grants approvals.

Policy 11: The City shall consider the use of floodplains as parks, nature trails, equestrian parks, golf courses, or other types of recreational facilities or joint-use facilities that can withstand periodic inundation.

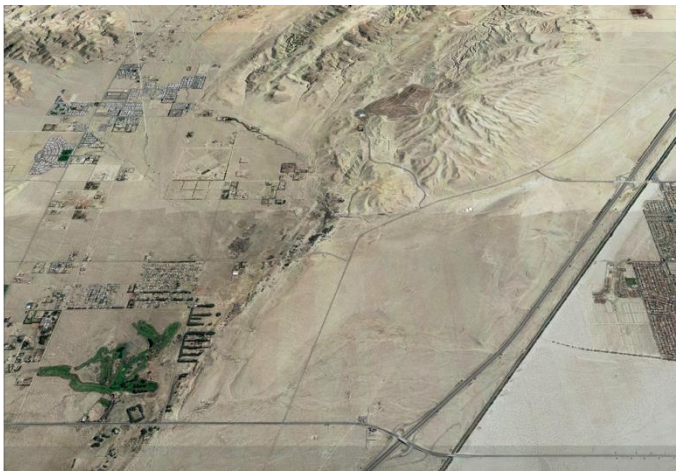
Geotechnical Sub-Element

PURPOSE

The purpose of Geotechnical Element is to identify seismic and other geologic hazards within the planning area, evaluate risks to property, infrastructure and human life, and provide goals, policies and programs that address these hazards. The element also provides essential information about the geologic conditions, sets forth strategies and requirements directed at protecting the general health and welfare of the community and reducing the potential for injuries, loss of life, and property damage resulting from seismic and other geologic hazards. The element and its supporting documentation also serve as an information database on regional geotechnical hazards as a foundation upon which future land use policies and decisions will be based.

BACKGROUND

The City and the Coachella Valley are located in one of the most geologically active regions on Earth. The valley is located within the Transverse geomorphic province, a structurally complex region[4] crossed by several major fault zones (i.e. Banning, San Jacinto, and San Andreas faults). These faults strongly influence the soils, geology, and seismicity of the region. The Geotechnical Element addresses potential geologic hazards that can result in significant property damage, generate significant clean-up and reconstruction costs, and interrupt the day-to-day operations of the City for months or years.



Geotechnical issues are directly related to a number of other General Plan elements and sub-elements, including the following: Land Use, Housing, Public Buildings and Facilities, Circulation and Mobility, Water, Sewer and Utilities, Water Resources, Flooding and Hydrology, Police and Fire Protection, Emergency Preparedness, and Economic and Fiscal Health elements.

Pursuant to California Government Code Section 65302(g), the General Plan is required to address and protect the community from the effects of known geologic risks and hazards, such as seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure. The element must also address slope instability leading to rockfalls and landslides, ground subsidence and liquefaction, and other seismic hazards identified in Chapter 7.8 (commencing with Section 2690) of the Public Resources Code, and other geologic hazards known to the City, including flooding, and wildland and urban fires (also see Emergency Preparedness Sub-Element).

Government Code Section 8876 sets forth a program that mandates the City and all other jurisdictions located within the most severe seismic shaking zone, designated as Zone 4 (as established in Chapter 2-23, Part 2, Title 24 of the Administrative Code), to identify all potentially hazardous or substandard buildings and implement a program for the mitigation of these structures.

[4] The San Andreas Fault System in the Vicinity of the Central Transverse Ranges Province, Southern California, (Open-File Report 92-354; 1992), by Department of the Interior, U.S. Geological Survey.

Geologic Setting

Cathedral City is located in the Coachella Valley which is a deep fault graben formed by tectonic movement along the San Andreas Fault (SAF) (Exhibit S-54.[5] The SAF is a complex strike-slip fault that represents a continuous zone of faulting from Point Mendocino in northern California to the Salton Sea and into the Sea of Cortez. It is more correctly referred to as a fault "zone", and the motion accommodated by the fault zone is distributed along a complex system of interrelated faults.6

The Coachella Valley is bounded by the Little San Bernardino Mountains on the north and northeast, Santa Rosa and San Jacinto Mountain Range on the southwest and west. Geologic materials of the San Bernardino Mountains to the northwest are mainly comprised of ancient basement rocks that have been uplifted to their current elevations. The southwestern and southeastern margins of the San Bernardino Mountains are traversed by several strands of the San Andreas Fault zone that are part of the geomorphic and structural boundary of the range. Together, the San Jacinto and Santa Rosa Mountains form the Peninsular Ranges Province and are classified as Mesozoic granite, which was first exposed about 95 million years ago. San Jacinto Mountain Range is traversed by San Jacinto Fault zone on its western margin.

The valley includes a diverse range of rocks and sediments formed or deposited over millions of years. Sediments from the surrounding mountain ranges are carried into and across the Coachella Valley through numerous seasonal streams flowing to the Whitewater River, San Gorgonio River and the Snow Creek, Chino Canyon, Tahquitz Canyon, Palm Canyon, Eagle Canyon, Mission, Big Morongo, and Little Morongo Creeks. The Whitewater River is the master drainage for the valley, which flows northwest to southeast. Episodic flooding of major regional drainages, including the Whitewater River and Coachella Valley Stormwater Channels, results in the deposition of sand and gravel on the valley floor.

Rocks and Sediments

The City's geologic composition is also related to its proximity to the San Andreas Fault, which passes through the northern portion of the valley and north city limits, and other active faults. The rocks and sediments exposed at the surface of the General Plan planning area, which can be classified based on their age, include:

1) Mesozoic and older (66 million years old and older) rocks in the Santa Rosa Mountains,
2) Middle to Early Pleistocene (11,000 to 1.6 million years old) sediments on Edom Hill, Flat Top Mountain, and the northwestern portion of the planning area, and
3) Holocene (0-11,000 years old) sediments on the valley floor.

Metasedimentary Rocks: The oldest rocks reported within the planning area are Cretaceous and pre-Cretaceous metamorphic rocks of sedimentary and volcanic origin. It is limited to the slopes of the Santa Rosa Mountains and typically are non-water-bearing, except where they are extensively jointed and fractured.

Alluvial Sediments: The most recently deposited sediments in the planning area are found on the wash, fan and valley alluvial areas, where water transports and processes these unconsolidated sandy and gravelly materials of Late Holocene age. Some are moderately loose sand and silty sand, boulder, cobble, gravel, sand, and silt deposits eroded from the confined valley or canyons. They are found in the southern and northern portion of the planning area along Santa Rosa Mountains and Flat Top Mountain southwest of Edom Hill. Other deposits are comprised of clay, silt, sand, and gravel and are found in the central planning area mainly along the Whitewater River, and the Salvia and Morongo Washes south of the Indio Hills and the Cathedral Canyon drainages at the base of the Santa Rosa Mountains. They also occur north of the Indio Hills.

[5] Alles, D. L. (2012). Geology of the Salton Trough.
[6] Hill, M. L., & Dibblee, T. W. (1953). San Andreas, Garlock, And Big Pine Faults, California: A Study of The Character, History, And Tectonic Significance Of Their Displacements. Geological Society of America Bulletin, 64(4), 443-458.

Alluvial plain sediments are typically loose near the ground surface but become denser with increasing depth. They have medium to high permeabilities, except where silt layers retard the percolation of water. Because these units can be readily compacted with a combination of saturation and wheel rolling with rubber-tired construction equipment, they are generally suitable for use as compacted fill. Shrinkage of 20% to 30% can be expected upon compaction. Alluvial fan sediments, which are dry with higher permeabilities, are also generally suitable for use as compacted fill. Compaction of the near-surface soils can be expected to result in up to 15% shrinkage.

Aeolian and Dune Deposits: These deposits are unconsolidated, generally well-sorted windblown (aeolian) sand which also occurs as dune sand deposits. These fine and medium-grained soils are picked up and transported by strong winds emanating from the San Gorgonio Pass at the northwesterly edge of the valley. They are redistributed along the central valley floor where they form shifting sand dunes. A thick accumulation of these windblown sands has formed the *Palm Springs Sand Ridge* that arises in Cathedral City and in places rises up to 120 feet above the valley floor. Windblown deposits underlie much of the developed portion of the planning area and sheltered portions of lands north of I-10.

Aeolian deposits are typically loose near the ground surface but become denser with increasing depth. Like alluvial deposits, they are generally suitable for use as compacted fill, as they can be readily compacted with a combination of thorough wetting and wheel rolling with rubber-tired construction equipment. These units typically have high permeabilities, and shrinkage of up to 30% can be expected upon compaction.

Geologic Hazards

Slope Instability

Land adjacent to the Indio Hills and the east to northeast-facing slopes of the Santa Rosa Mountains have a moderate to high susceptibility to rock falls and land-sliding. The metasedimentary and intrusive rocks of the slopes of the Santa Rosa Mountains have several planes of weakness, including joints, fractures, and foliation. Depending on their orientation, these areas could be susceptible to failure. Additionally, as these rocks weather they can form rounded boulders that perch precariously on steep slopes, and pose rock fall hazards down slope. Areas with surface soils comprised of sands and other less cohesive soils, and located on sloping terrain, can be subject to sliding during strong ground shaking.

Earthquake-induced landslides and rock falls may occur in both the Indio Hills and Santa Rosa Mountains and are addressed in subsequent sections of this element. Mitigation of these hazards is best accomplished by avoiding development on steep slopes and implementing structural setbacks at the toe of slopes. Any proposed development adjacent to steep slopes of the Santa Rosa Mountains or Indio Hills should include an analysis for potential slope instability. Areas of potential slope instability are shown on Exhibit S-2.

Collapsible Soils

Soil collapse, or hydro-consolidation, occurs when soils undergo a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. This phenomenon typically occurs in recently deposited Holocene soils in a dry or semi-arid environment, including aeolian sands and alluvial fan and mudflow sediments deposited during flash floods. The combination of weight from a building or other structure, and an increase in surface water infiltration (such as from irrigation or a rise in the ground water table) can initiate rapid settlement and cause structural foundations and walls to crack.

Alluvial and aeolian sediments in the planning area have the potential for collapse. Where development is proposed on these soils, this hazard should be evaluated as part of site-specific geotechnical evaluations, and recommendations should be made to mitigate the potential hazard. These studies should include analysis of the settlement potential of the entire soil column to the effective depth of infiltration of irrigation water, rather than only the near-surface soils. Additional recommendations that can mitigate these impacts include pre-watering of susceptible soils to induce collapse prior to construction, designing drainage to flow away from structures, avoiding open-bottomed planters adjacent to structures, using roof gutters to direct drainage away from foundations, and limiting the use of irrigation water.

Expansive Soils

Expansive soils contain significant amounts of clay particles and have the ability to give up water (shrink) or take on water (swell). When swelling occurs, the soils can exert significant pressure on structures (e.g. buildings, channel linings and other structures) built upon them and can result in structural and other damage. Surface soils in the planning area are generally described as predominantly sand, riverwash gravels, and rock outcrop, with the relatively minor amount of clay. The minor amounts of clay present in the area are not considered a hazard to development in the planning area. The older fan deposits of the Indio Hills may contain clay-rich soils near the surface, these units are typically removed and recompacted during grading. Mixing of soils during this process is expected to reduce their expansion potential.

Ground Subsidence

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement, and is usually associated with the extraction of oil, gas, or ground water. During this process, fluids (including water) and gases contained in subsurface clay layers are squeezed or pumped out, and the clay is compacted by the weight of overlying sediments. Subsidence can result in damage to structures that are sensitive to slight changes in elevation, such as larger buildings and foundations, canals and channel lining, and wells. Subsidence can also result in changes to surface drainage, reductions in aquifer storage capacity, and the formation of earth fissures.

Subsidence as a result of groundwater withdrawal is one of the major environmental constraints facing the Coachella Valley, although most evidence of regional subsidence has been observed in the eastern Coachella Valley. Since the late 1970s, the regional demand for groundwater has exceeded the supply, and the ground water basin in the Coachella Valley is currently in a state of overdraft. Continued overdraft of the aquifer would result in declining groundwater levels, thereby increasing the potential for associated subsidence. It should be noted that the regional groundwater managers, including CVWD and DWA, have been proactive in securing and importing water to recharge the aquifer. It is hoped that the ongoing overdraft condition will end by the early 2020s.

Wind Erosion

Wind funneling through the San Gorgonio Pass picks up sands and silts from the alluvial plain and washes and carries them across the valley floor, sorting these materials into various grades of coarseness. Wind erosion is a serious environmental problem in the valley often resulting in soil degradation, damage to cars and structures, and contributing to poor air quality.

As shown in Exhibit S-3, most of the General Plan planning area is located within *very severe* and *severe* wind erosion hazard zones. While winds may be strong across all portions of the City, it is the silty and light sandy soils that are most erosive. Land development and other sources of soils destabilization directly and indirectly aggravate soil erosion by removing the stabilizing crust of undisturbed soils, and destroying vegetation.

Pursuant to California Government Code Section 65302(d)(2), the General Plan is required to incorporate policies to prevent soil erosion and protect the community from its effects. For Cathedral City, the mitigation of this hazard has required the development and implementation of multi-faceted dust control plans during and following development. Please see the *Air Quality Element* for more information on City and regional dust control measures.

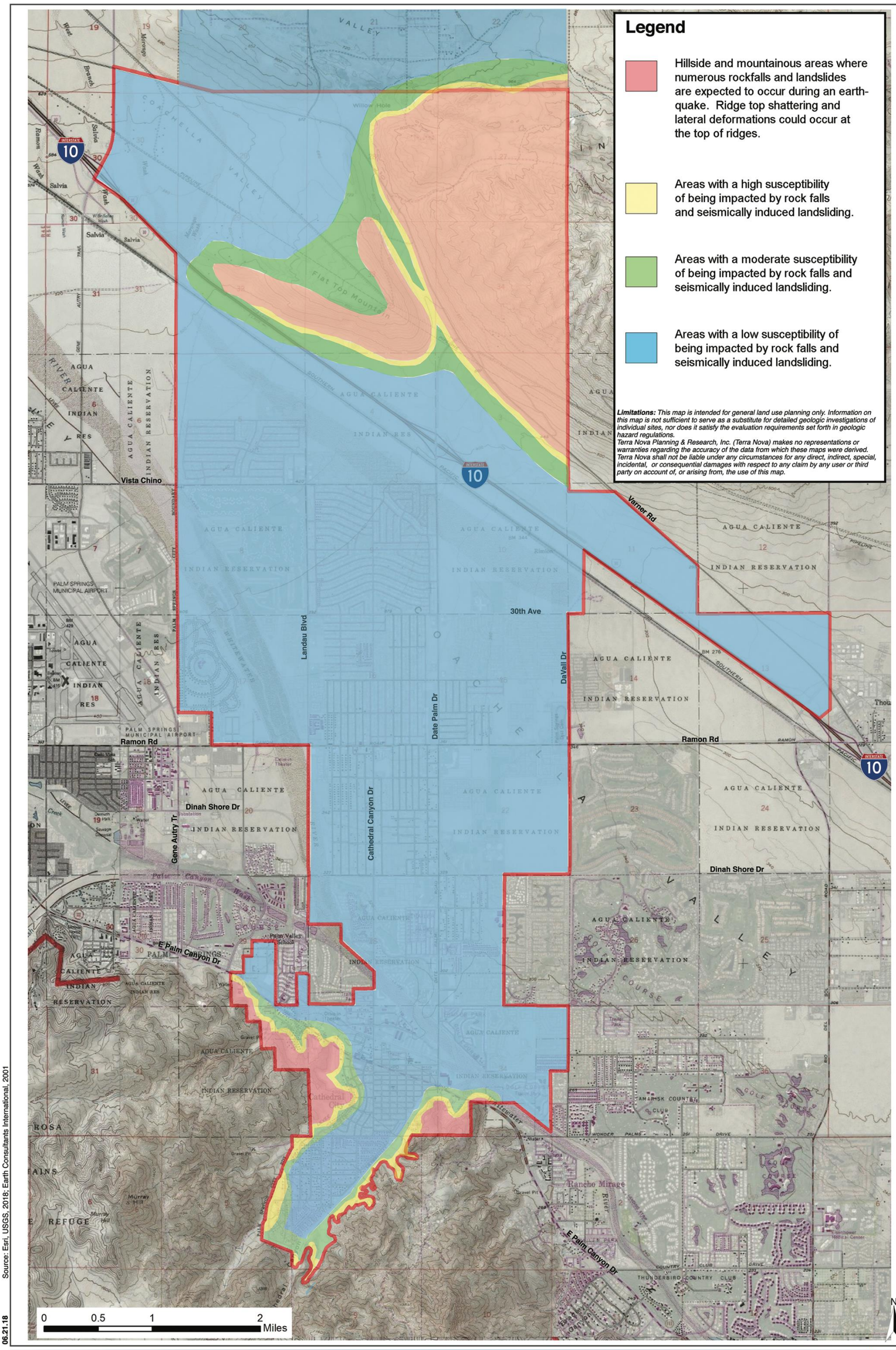


Exhibit S-2 - Seismically Induced Rock Fall and Landslide Suceptibility
Cathedral City 2040 General Plan

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Cathedral City

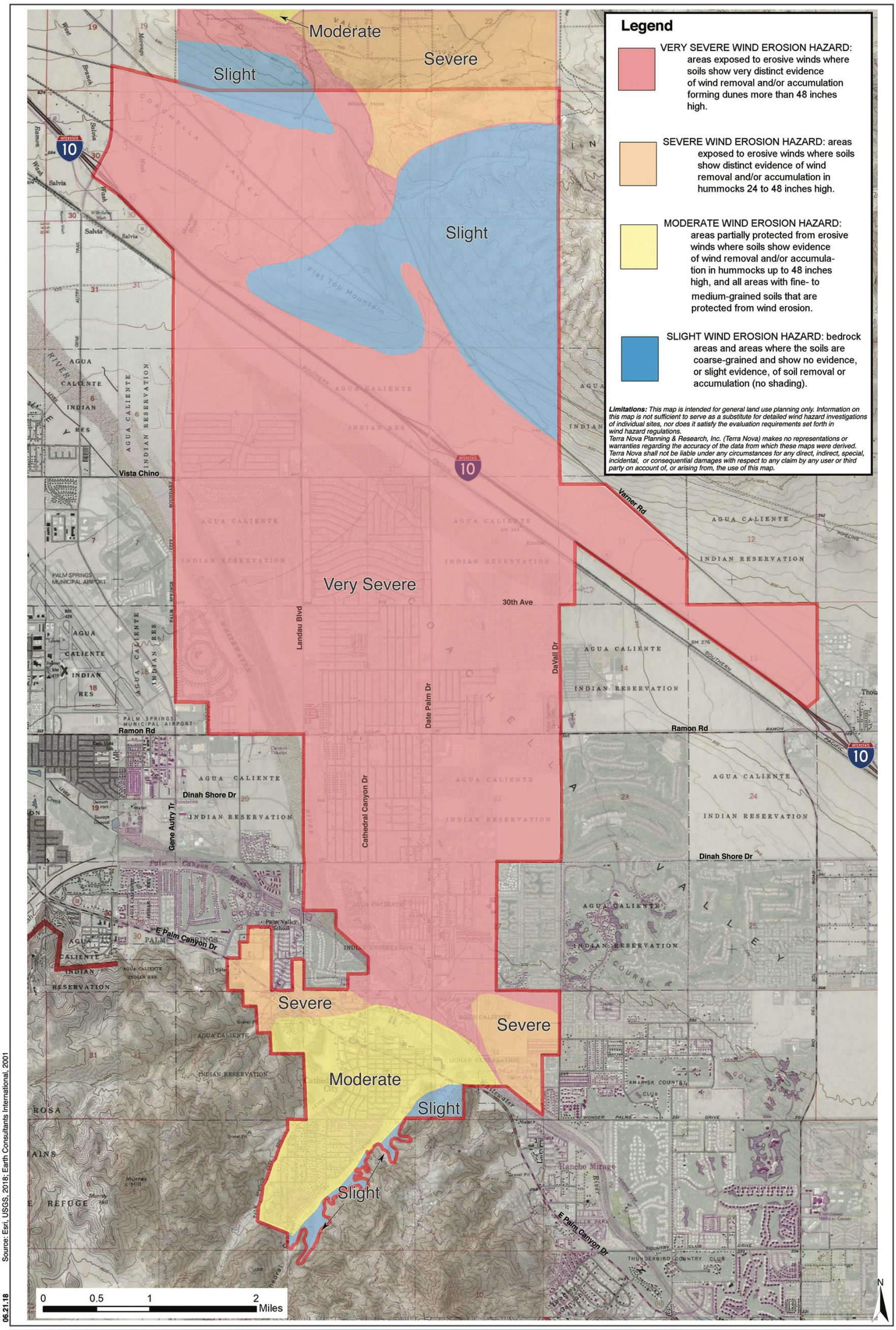

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Exhibit S-3 - Wind Hazard Zones
Cathedral City 2040 General Plan

Cathedral City

REGIONAL TECTONIC SETTING

Cathedral City is located along the southern segment of the San Andreas Fault Zone, an active fault zone that has the greatest influence on seismic hazards in the City and valley. The San Jacinto Fault Zone west and at the foot of the San Jacinto Mountains also has the potential to generate strong ground shaking in the City. Other numerous earthquake-producing faults in the region include the Pinto Mountain Fault to the north, faults in the Eastern California Shear Zone (including the Burnt Mountain, Eureka Peak, and Pisgah-Bullion Mountain-Mesquite Lake faults), and the Elsinore Fault to the west. Faults that have not shown movement within the past 11,000 years are considered to be "*inactive*".

The San Andreas Fault passes through the northern portion of the City and is capable of generating magnitude 8.0+ earthquakes. Portion of faults in this area are within the Alquist-Priolo Earthquake Fault Zone and Riverside County-designated fault zone hazard maps. The network of the faults in the City is shown in Exhibit S-4 and discussed below.

San Andreas Fault Zone

The San Andrea Fault Zone consists of northwest-southeast trending faults and folds that extend from the Salton Trough and the Sea of Cortez on the southeast, northward to approximately Point Mendocino. This fault zone is approximately 800 miles in length. In southern California, the San Andreas fault system is comprised of three segments: 1) Mojave Desert segment, 2) San Bernardino Mountains segment, and 3) Coachella Valley segment.[7]

Currently, portions of the Coachella Valley segment fault are located within Alquist-Priolo Earthquake Fault Zone. The Coachella Valley segment crosses the General Plan planning area. It consists of two fault strands: the San Andreas Fault strand (also known as the North Branch or Mission Creek fault) which occurs north and east of the planning area; and the Banning Fault strand (also known as the South Branch fault) which extends across the northern portion of planning area.

The two strands merge southeast of the planning area, near Indio, and continue southeastwardly toward the United States-Mexico border. Paleoseismic studies that include fault trenching indicate that the last surface-rupturing earthquake on the Coachella Valley segment occurred around 1680. Prior to this, earthquakes on this fault occurred at an average recurrence interval of every 220± years. The merged segment is creeping at a rate of about 25 mm/year (5± mm/year), has more than a 22% probability of rupturing before the year 2024, and is expected to generate earthquakes with a magnitude of 6.0-7.0 on the Richter scale.

The Banning Fault of the Coachella Valley segment, which passes through the planning area, is capable of producing a magnitude 7.4 earthquake that would result in peak horizontal ground accelerations of between 0.45 and 0.9g in Cathedral City. Within the planning area, it consists of several splays that branch off from one another, then come together. In the vicinity of the Edom Hill Landfill, just east of the planning area, the fault consists of one main fault and at least three secondary splays. The Banning Fault is believed to have been responsible for generating the magnitude 5.9 North Palm Springs earthquake in 1986. Although the ground surface did not rupture during this quake, ground fractures occurred on the northern side of the fault, between Whitewater Canyon and State Highway 62.

[7] Natural Hazard Mapping, Analysis, and Mitigation: a Technical Background Report in Support of the Safety Element of the New Riverside County 2000 General Plan, prepared by Earth Consultants International on August 2000.

The Mission Creek fault is capable of generating a magnitude 7.1 earthquake, with resultant peak ground accelerations of between 0.4 and 0.8g in the City. Geotechnical studies in the Desert Hot Springs area have documented several breaks that can be traced upward to within one foot of the ground surface. It is estimated that the City would be susceptible to ground accelerations greater than 1.0g during a simultaneous rupture of the Banning and Mission Creek faults.

The Coachella Valley segment joins the San Bernardino Mountains segment to the northwest of the planning area, near the northwestern limits of the City of Desert Hot Springs. The San Bernardino Mountains segment has a slip rate of about 24± mm/year (5± mm/year), with an average recurrence interval of 146 years. It is estimated that this segment has a 28% probability of rupturing before year 2024.

Garnet Hill Fault

The Garnet Hill fault is mapped as a buried fault and is based on a gravity anomaly survey of the Coachella Valley by a major oil company.8 The Garnet Hill fault is not mapped as offsetting Holocene- age materials9 and, therefore, does not display evidence of being active10. The fault can act as a plane of weakness and move in response to an earthquake on another nearby fault.

Although the California Division of Mines and Geology (California Geological Survey) has not designated it as an active fault subject to fault study, Riverside County has designated the Garnet Hill fault for further study. The Garnet Hill fault extends from the vicinity of Whitewater Canyon to the southeast portion of Edom Hill where it crosses the planning area near and north of I-10 and dies out.11 This fault is primarily a right-lateral strike-slip fault along most of its trace, but splays into a series of oblique reverse faults at its western end. The Garnet Hill fault consists of a series of left-stepping, northwest-trending right-lateral faults with active folds at each stepover.12 The discontinuous geometry of the Garnet Hill fault and the small size of these folds suggest that cumulative slip is too low to have led yet to integration of the fault into a single strand. The slip rate of the Garnet Hill fault has not yet been determined.

The Garnet Hill fault and the Coachella Valley segment of the Banning fault merge at a depth of about 5 km to form a single fault and merge with the San Gorgonio Pass fault system.13 Seismological data also suggest that the Garnet Hill fault merges with the San Gorgonio Pass fault zone to carry slip between the disconnected segments of the San Andreas fault, thus making the Banning-Garnet Hill-San Gorgonio Pass system a significant seismic source in the region. Based on the seismic pattern, it is interpreted that the M5.9 1986 North Palm Springs earthquake main shock and aftershock sequences have occurred on the Banning strand14; however, the main event has occurred on the linked San Gorgonio Pass-Garnet Hill-Coachella Valley Banning fault15. The Garnet Hill fault has been mapped by the County of Riverside and referred to as County Fault Zone.16 The County applies Alquist-Priolo Earthquake Fault Zoning Act provisions to the Garnet Hill fault to minimize the impacts.

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8 Geology of the Desert Hot Springs-Upper Coachella Valley area, California, California Division of Mines and Geology Special Report 94, 50 (1968). by Richard J. Proctor.

9 Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions: California Division of Mines and Geology, Geologic Data Map No.6, Scale 1:750,000.

10 Hart, E.W., Smith, D.P., and Saul, R.B. 1979. Summary Report: Fault Evaluation Program, 1978 Area (Peninsular Ranges-Salton Trough Region): California Division of Mines and Geology, Open File Report 79-10.

11 Holocene geologic slip rate for the Banning strand of the southern San Andreas Fault, southern California by Gold et al., 2015.

12 Complexities of the San Andreas fault near San Gorgonio Pass: Implications for large earthquakes, by Yule and Sieh (2003).

13 Ibid.

14 Jones, L. M., L. K. Hutton, D. D. Given, and C. R. Allen (1986), The North Palm Springs, California, earthquake sequence of July 1986, Bull. Seismol. Soc. Am., 76, 1830–1837.

15 Ibid.

16 County of Riverside General Plan (2004)-Safety Element.

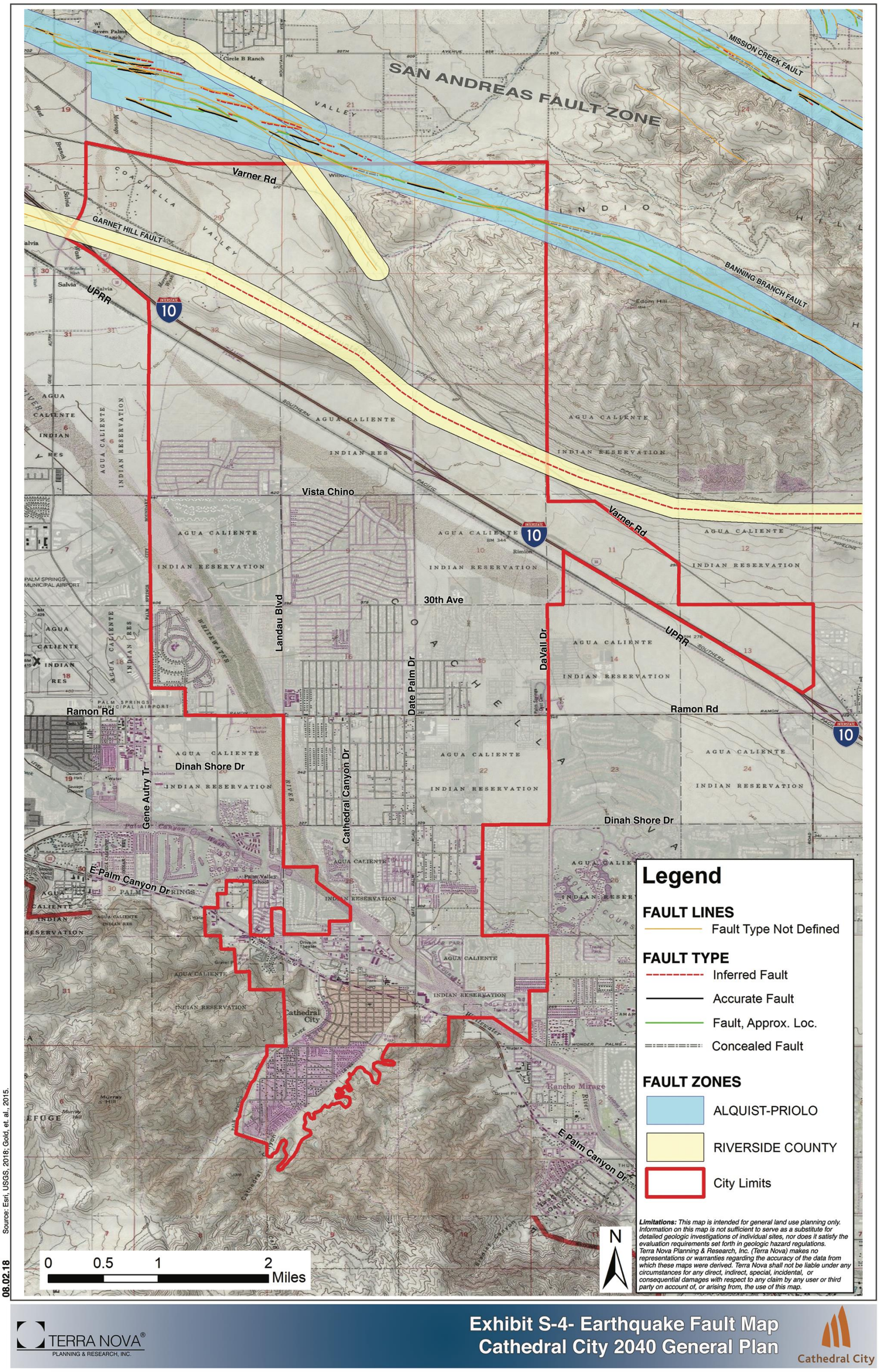

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Exhibit S-4- Earthquake Fault Map
Cathedral City 2040 General Plan

Cathedral City

San Jacinto Fault Zone

As noted, the San Jacinto Fault Zone extends from the City of San Bernardino, southeasterly toward the Brawley area, where it continues south of the U.S./Mexico border as the Imperial Fault. The fault is south of the Planning Area but has a high level of historic seismic activity, with at least ten moderate (M6> to 7>) earthquakes having occurred between 1890 and 1986, with an estimated recurrence interval of between 150 and 300 years.

Available data suggest that the slip rates of the fault's northern segments are about 12± mm/year (6± mm/year), and slip rates of the southern segments are about 4± mm/year (2± mm/year). The San Bernardino and San Jacinto Valley segments are estimated to have a 37% and 43% probability, respectively, of rupturing before the year 2024. Based on a maximum credible earthquake of magnitude 7.0 on the closest segment on this fault, such an event would generate horizontal ground acceleration of 0.1 to 0.25g in the City.

East Mojave Shear Zone

The East Mojave Shear Zone includes several northwest-trending faults in the southern Mojave Desert that collectively appear to be accommodating between 9% and 23% of the motion between the North American and Pacific tectonic plates. Paleoseismic studies indicate that several earthquakes have occurred in this area during the Holocene Epoch, including the 1992 Landers earthquake, which occurred on the Johnson Valley fault. A magnitude 7.3 earthquake on one of these fault segments is expected to generate a peak horizontal ground acceleration of between 0.1 and 0.15g and MMI seismic intensity of between VII and VIII in Cathedral City.

Pinto Mountain Fault

The Pinto Mountain fault is an east-trending fault that is traceable for approximately 47 miles, from its junction with the San Andreas fault eastward to just east of the City of Twentynine Palms, north of the planning area. The Pinto Mountain fault is considered active, and Holocene Epoch movement has been documented. The fault is capable of generating a maximum credible earthquake of 7.0, which would generate peak horizontal ground accelerations of between 0.15 and 0.3g in the General Plan planning area.

Seismic Activity in the Planning Area

California Government Code Section 65302(g)(1) requires that the General Plan incorporate policies to address seismic risks, avoid earthquake-caused ground-failure hazards and protect the community from seismic hazards. Several faults present in the planning area are capable of generating strong ground shaking. Potential seismic intensities in the City and surrounding area associated the earthquakes are shown in Table S-1 below.

Table S-1
Potential Seismic Intensities Associated with the Maximum Credible Earthquake (MCE)

Fault Name	Distance to GP Area (miles)	Magnitude of MCE	Peak Ground Acceleration of MCE (g)*	MMI** from MCE
San Andreas				
Coachella Segment (south strand)	0 –9	7.4	0.459	X-XII
Coachella Segment (north strand)	1 – 10	7.1	0.435	X-XI
San Bernardino Mtns. Segment	4 – 11	7.3	0.332	IX-XI
Garnet Hill	0-6	7.0	0.17 – 0.70	VIII - XI
East Mojave Shear				
Burnt Mountain	7 – 14	6.4	0.201	VIII-IX
Eureka Peak	9 – 16	6.4	0.165	VII-IX
Landers	20 – 28	7.3	0.15-0.25	VI-IX
Lenwood-Lockhardt-Old Woman	34 – 40	7.3	0.06 - 0.11	VI-VII
Camp Rock-Emerson-Copper Mtn	25 –32	6.9	0.10-0.15	V-VIII
Johnson Valley (northern)	30 – 38	6.7	0.05-0.10	V-VII
Pisgah-Bullion Mtn-Mesquite	31 – 37	7.1	0.05-0.15	V-VIII
Calico-Newberry-Hidalgo	35 – 43	7.1	0.05-0.10	IV-VIII
Helendale-S. Lockhardt	41 – 47	7.1	0.05-0.10	IV-VII
North Frontal Fault Zone	30 – 47	7.0	0.15-0.30	VIII-IX
Pinto Mountain	15 – 22	7.0	0.15-0.30	VIII-IX
San Jacinto				
Anza	17 – 24	7.2	0.135	VIII-IX
Coyote Creek	21 – 29	6.8	0.092	VI-VIII
San Jacinto (San Jacinto Valley)	25 - 29	6.9	0.09 - 0.10	VII-VII
Elsinore	40 – 47	7.1	0.05-0.10	V-VII

* Peak Ground Acceleration, where g is the acceleration of gravity, equal to 9.8 m/sec^2
** MMI = Modified Mercalli Intensity
Sources:
Table 3, "Geotechnical Engineering Update Report Environmental Impact Assessment Proposed 567 Acre Specific Plan Development Area of Varner Road and Bob Hope Drive, County of Riverside, California," prepared by RJR Engineering, June 2013.
Table 1-2, "Technical Background Report to The Safety Element of The General Plan for The City of Palm Springs, Riverside County, California," prepared by Earth Consultants International, Inc., September 2005.
Table 1-2, "Seismic, Geologic, and Flooding Sections of the Technical Background Report to the Safety Element of the General Plan for Cathedral City," prepared by Earth Consultants International, Inc., June 1999.

SEISMICALLY INDUCED GEOTECHNICAL HAZARDS

Liquefaction

Liquefaction is the total or substantial loss of shear strength of loose, sandy, saturated sediments in the presence of ground accelerations greater than 0.2g. When liquefaction occurs, the sediments involved behave like a liquid. This phenomenon can result in structural stress and/or failure due to settlement, the buoyant rise of buried structures such as tanks and pipelines, the formation of mud spouts and sand boils, and seepage of water through ground cracks.

As shown on Exhibit S-5, the potential for liquefaction to occur is low-to-none throughout most of the planning area, principally because groundwater in the Cathedral City area typically occurs 150 to 200 feet below the ground surface, too deep to saturate the loose sediments of the valley floor. Although depth to groundwater may be less than 50 feet adjacent to the Santa Rosa Mountains in the southern planning area, the alluvial sediments in this area are coarse-grained sand, gravels, cobbles, and boulders that are not susceptible to liquefaction.

The potential for liquefaction is moderate to high, however, in the northern portion of the planning area, in the vicinity of the San Andreas Fault. In this area, the fault acts as a barrier or dike to the flow of groundwater. This causes groundwater to rise along the fault and to occur at shallow depths at these locations, which are also typically boundaries between subbasins. Historically, springs and flowing wells have been observed at Willow Hole and areas just north of the planning area. During well drilling in 1981, groundwater was reported at depths of less than 30 feet northeast of Willow Hole. Given that groundwater occurs within 50 feet of the surface in this area, the unconsolidated alluvial sediments are highly susceptible to liquefaction. Shallow groundwater has also been reported along the northern side of the Banning Fault, but sediments in this area are semi-consolidated to consolidated and not as susceptible to liquefaction.

Seismically Induced Settlement

Strong ground shaking can cause soils to become dense or to compact, resulting in local or regional settlement of the ground surface. Settlement can damage structures and foundations, as well as pipelines, canals, and other grade-sensitive structures. The potential for seismically induced settlement to occur is controlled by the intensity and duration of ground shaking and the density of subsurface soils.

As shown in Exhibit S-6, the valley floor is mainly comprised of loose, recently deposited sediments and is highly susceptible to seismically-induced settlement. Development proposed in these areas should include subsurface geotechnical investigations that evaluate the potential for seismically-induced settlement. Proper foundation design and the densification or compaction of subsurface soils prior to development can mitigate some of the damaging effects associated with settlement.

Seismically-Induced Slope Instability

It is estimated that a ground acceleration of at least 0.10g in steep terrain is necessary to generate earthquake-induced rock falls. Given that several nearby faults are capable of generating peak ground accelerations of this magnitude in Cathedral City, there is a moderate to high potential for seismically-induced rock falls and landslides to occur in the General Plan planning area. Susceptible areas are shown on Exhibit S-2 and include areas within and adjacent to the slopes of the Santa Rosa Mountains and Indio Hills, particularly where the bedrock of the Santa Rosa Mountains is highly fractured or jointed. As shown in Exhibit S-2, nearly all of the areas with a moderate or high susceptibility to slope instability are currently undeveloped. The East and West Cathedral Canyon Washes act as a buffer between the slopes of the Santa Rosa Mountains and development in the Cove, and would be expected to absorb much of the potential damage from rock falls and provide some level of protection to existing habitable development.

Intense ground shattering can be expected at the top of Edom Hill and other narrow, steep ridges, where topographical features can localize and focus the ground shaking at the ridge top. Mitigation of these hazards can be best achieved by avoiding development on steep slopes and enforcing appropriate building setbacks at the base of the slopes. Even engineered cut and fill slopes constructed on the valley floor may be subject to failure if they are of sufficient height. These slopes must be designed to resist seismically induced failure, and their design should be based on site-specific soil stability analyses that include subsurface soil sampling and laboratory testing.

Seiches

Seiches refers to the seismically-induced oscillation or sloshing of water contained in an enclosed basin, such as a reservoir, pond, water storage tank, or swimming pool. This hazard is dependent upon the frequency of seismic waves, distance and direction from the epicenter, and design criteria of the enclosed body of water. Although damage from small bodies of water, such as swimming pools, would be expected to be minor, damage to or failure of larger bodies of water, such as water tanks and retention basins could result in the inundation of land and structures downslope, hinder efforts to suppress fires, and limit the supply of potable water after a major earthquake.

The Desert Water Agency owns four water reservoirs, which are situated on elevated terrain in the Santa Rosa Mountains surrounding and near the Cathedral Canyon Cove. Damage to and/or failure of these tanks could result in inundation of homes and property in these areas of the City. Two water reservoirs owned by the Coachella Valley Water District are located on the north edge of Flat Top Mountain just south of Varner Road in the northern portion of the planning area. Although land downgradient from these tanks is currently vacant, tank damage or failure could impact future development. Design elements, such as baffles and braces, are warranted to reduce the potential for seiches in tanks, open reservoirs, and ponds where overflow or structural failure may cause damage to nearby properties. The American Water Works Association (AWWA) Standards for Design of Steel Water Tanks includes updated criteria for the seismic design of water tanks.

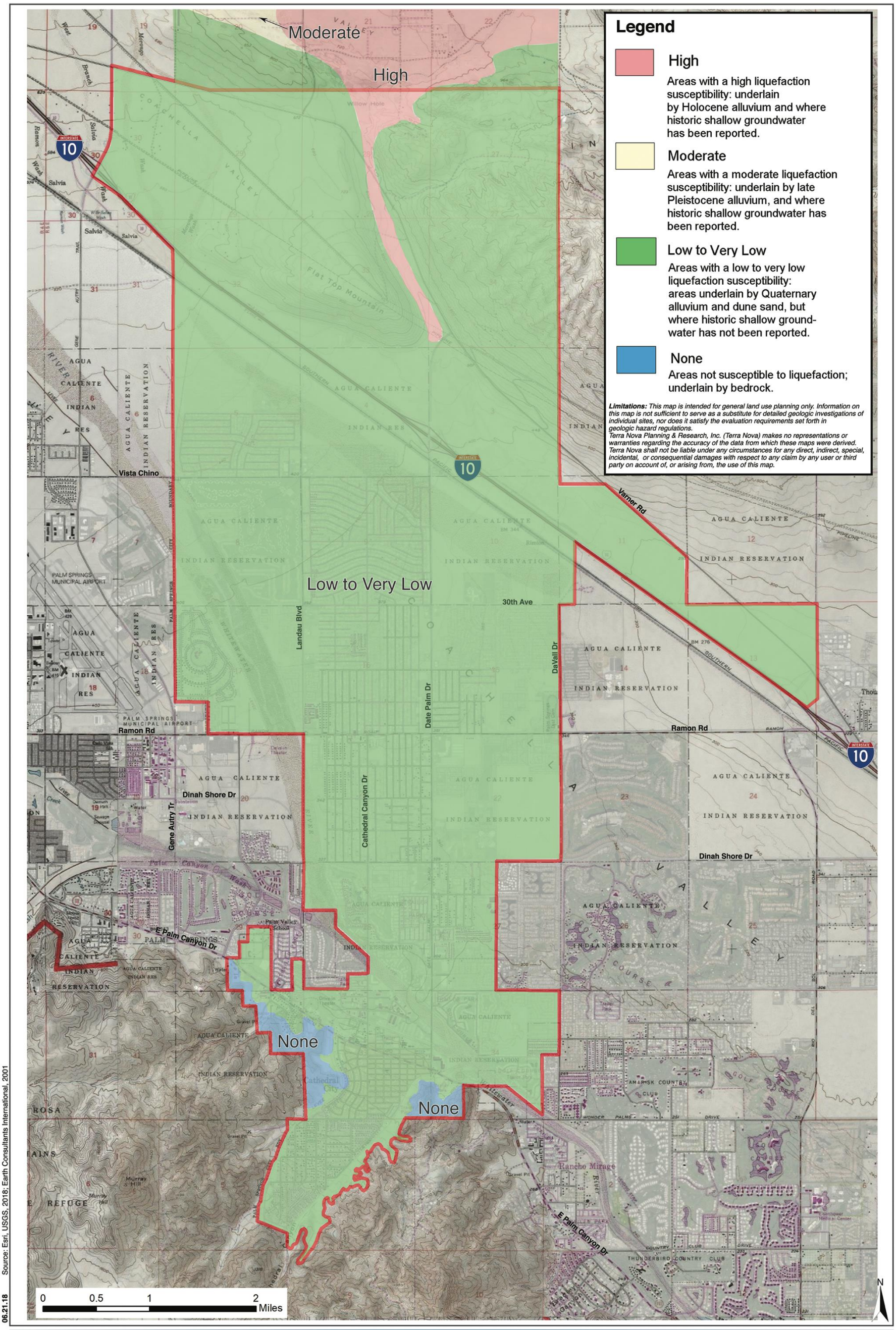

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Exhibit S-5 - Liquefaction Suceptibility Map
Cathedral City 2040 General Plan

Cathedral City

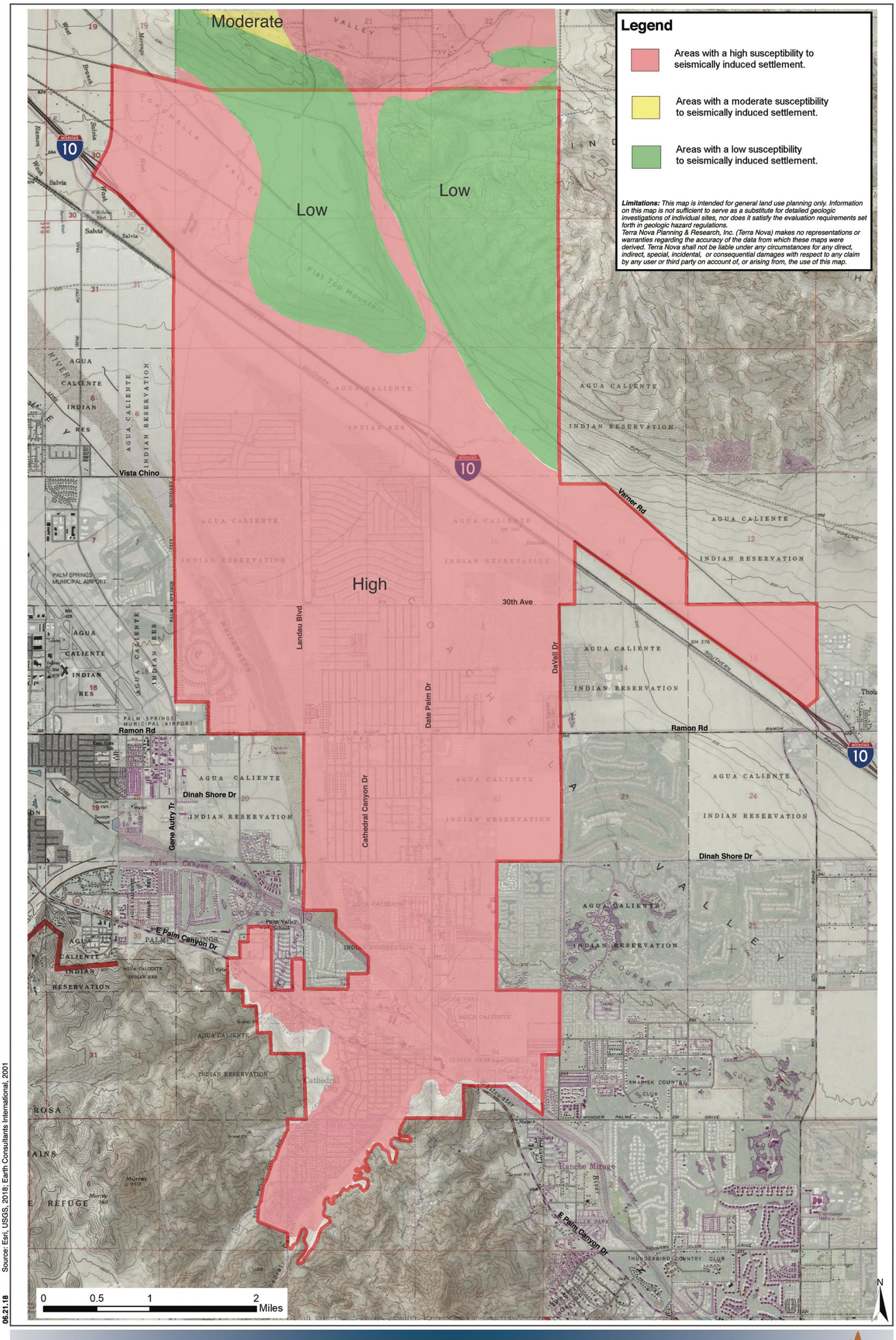

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Exhibit S-6 - Susceptibility to Seismically Induced Settlement
Cathedral City 2040 General Plan

Cathedral City

FUTURE DIRECTIONS

This section of the General Plan sets forth goals, policies and programs that address issues related to geologic and seismic hazards. Comprehensive mitigation measures include the identification and mapping of potential hazards, prudent planning efforts, enforcement of applicable building codes, and expedient retrofitting of weak or dangerous structures. The City will also rely on the regulations and guidelines set forth in the Alquist-Priolo Earthquake Fault Zoning Act, State CEQA statutes, PM_{10} control plans, and the California (International) Building Code. The Planning Department must assure that development proposals are thoroughly evaluated with regard to geotechnical and seismic safety, and that all necessary site-specific geotechnical studies are conducted and thoroughly evaluated.

GOALS, POLICIES AND PROGRAMS

Goal 1: The protection of human life, public and private property, utility structures, and land from the adverse effects of seismic and geologic hazards.

Policy 1: The City shall establish and maintain an information database containing maps and other information which describe seismic and other geotechnical hazards occurring within the City boundaries, sphere-of-influence and planning area.

Program 1.A: Consult and coordinate with surrounding communities, the California Division of Mines and Geology, Riverside County, other applicable state and federal agencies, and professional engineering geologists to establish, improve and routinely update the database.
Responsible Agency: Planning, California Geologic Survey, County Geologist, Consulting Geologists
Schedule: 2019-20; Continuous

Program 1.B: Establish and maintain a GIS database and mapping of the various geotechnical conditions, hazards and constraints within the City
Responsible Agency: Planning
Schedule: 2019-20; Continuous

Program 1.C : Secure available publications from trade organizations and the state, and make available to developers, property owners, and other appropriate parties, regarding geotechnical investigations that must be carried out within Alquist-Priolo Earthquake Fault Zones.
Responsible Agency: Engineering, Building
Schedule: 2019-20

Policy 2: Continue to regularly update building and fire codes to provide for changes or advancements in seismic safety design.

Program 2.A Regularly consult and coordinate with the California Geological Survey, other relevant state and federal agencies, and surrounding communities to establish, maintain, and update building, seismic and fire codes.
Responsible Agency: Planning, Engineering/Consulting Geologist
Schedule: 2019; Routine updating

Policy 3: All new development shall be constructed in accordance with the prevailing seismic design requirements contained in the most recently adopted edition of the California (International) Building and Fire Codes and as otherwise required by the City.

Policy 4: The City shall require geological and geotechnical investigations in areas of potential seismic or geologic hazards as part of the environmental and development review process. The City shall not approve proposals and projects for development or redevelopment which do not provide for mitigation of seismic or geologic hazards to the satisfaction of the responsible agencies.

> **Program 4.A :** The City shall pursue a cooperative agreement with the Riverside County Geologist, State Geologist, or contract geological engineer to review and determine the adequacy of geotechnical and fault hazard studies.
> **Responsible Agency:** Planning, Engineering
> **Schedule:** 2019-20

Policy 5: Promote and encourage the strengthening of older, inadequately reinforced structures in the City by retrofitting to better resist the effects of strong ground shaking.

Policy 6: The City shall encourage the strengthening of such critical public facilities such as utilities, schools, hospitals, healthcare facilities, eldercare facilities, police and fire stations, and emergency communication facilities.

> **Program 6.A:** The City shall prepare and distribute informational to residents, business owners and property owners, that encourage and facilitate retrofitting of privately-owned structures, including describing appropriate methods of rehabilitation, and possible methods of financing such improvements.
> **Responsible Agency:** Planning, Engineering
> **Schedule:** 2019-2020

> **Program 6.B:** Coordinate with CVWD, DWA, SCE, SCG, Frontier Communications, Spectrum and other appropriate agencies, to develop and implement strategies to safeguard major utility systems, and to strengthen or relocate facilities that are in potentially hazardous areas.
> **Responsible Agency:** Planning, Public Works, Engineering, public and quasi-public agencies
> **Schedule:** Immediate; Continuous

> **Program 6.C :** Coordinate and cooperate with Caltrans, County Transportation and adjoining cities to maximize the resilience of local and regional transportation systems, including US Interstate-10 and other major transportation corridors in the event of a major quake.
> **Responsible Agency:** Public Works, Engineering, Caltrans, County Transportation, Adjoining Cities, CVAG
> **Schedule:** Immediate; Continuous

Policy 7: To the extent feasible, regulate the location of new structures, including utilities, schools, hospitals, healthcare and eldercare facilities, police and fire stations, and emergency communication facilities, in and near areas that would directly be affected by seismic or geologic hazards.

Policy 8: Development proposed for human occupancy on lands within a City Fault Hazard Management Zone and where the location of the fault has not been firmly determined, fault trenching and other geotechnical investigations shall be required. Based on these investigations the City may restrict or prohibiting construction of structures for human occupancy across the fault trace.

> **Program 8.A:** The City shall cooperate with county, state and federal agencies in conducting geological investigations of the Garnet Hill and San Andreas faults. The City shall investigate the possibility of partnering with the Earthquake Hazards Program of the U.S. Geological Survey to better identify the active traces of the Garnet Hill and San Andreas faults.
> **Responsible Agency:** Planning, Engineering
> **Schedule:** On going.

Program 8.B: The City shall require geological studies, such as fault-trenching, of the defined traces of the Garnet Hill and San Andreas fault traces shown on Exhibit S-4. The studies shall be conducted by State-certified engineering geologists following the guidelines established in the Alquist-Priolo Earthquake Fault Studies Act. The City Geologist shall review the fault studies to ensure that excavations were conducted with an acceptable level of effort to determine whether there are active faults through the proposed development, and that suitable fault setbacks are defined.
Responsible Agency: Planning, Engineering, County Geologist
Schedule: On going.

Program 8.C: The City shall require geological studies of the less well-defined traces of the Garnet Hill and San Andreas faults shown on Exhibit S-4 for critical facilities proposed within this zone. The studies shall be conducted by State-certified engineering geologists.
Responsible Agency: Planning, Engineering
Schedule: On going.

Policy 9: Where development is proposed in areas identified as being subject to geotechnical hazards (including, but not limited to slope instability, soil collapse, liquefaction and seismically induced settlement), the City shall require the preparation of site-specific geotechnical investigations by the applicant prior to completion of CEQA studies and development approval. All such studies shall include mitigation measures that reduce associated hazards to insignificant levels.

Policy 10: To avoid and minimize soil erosion, all grading, earthwork, and construction activities shall be in accordance with applicable fugitive dust control ordinances and regulations, including those established by the City, CVAG, SCAQMD, and other appropriate agencies.

Policy 11: To minimize the potential impacts of subsidence due to the extraction of groundwater, the City shall actively support and participate in local and regional efforts at groundwater conservation and recharge.

Policy 12: Restrict development along the foothills to minimize the potential impacts of slope failure. In addition, minimize grading and modification to the natural topography to prevent potential for man-induced slope failures.

Program 12.A: The City shall discourage any grading beyond that necessary to create adequate and safe building pads. The Engineering and Consulting Geotechnical Engineer shall conduct regular inspection of grading operations to maximize site safety and compatibility with community character.
Responsible Agency: Planning, Engineering, Consulting Geologist
Schedule: On going.

Program 12.B: In the hillside or mountainous areas of Cathedral City, the City shall discourage excessive grading of slopes greater than 3:1 (horizontal:vertical), and shall encourage varied slope ratios on design slopes to reduce the visual impact of grading. Cut or fill slopes steeper than 2:1 shall not be permitted.
Responsible Agency: Planning, Engineering
Schedule: On going.

Policy 13: The City Shall ensure to the fullest extent possible that, in the event of a major geologic disaster, dependent care and high-occupancy facilities will remain safe.

Policy 14: The City's Fire Department, as part of their annual inspections of businesses and dependent care facilities and schools, shall encourage and educate the owners or operators about maintaining accessibility following and earthquake, emergency backup power, and securely anchored shelves, computers and other equipment, and other non-structural elements.

Hazards and Hazardous Materials Sub-Element

PURPOSE

The purpose of the Hazards and Hazardous Materials Sub-Element is to identify, assess threats and protect the general public from hazards and hazardous materials within the community. It also provides guidance and methods to safely manage these hazards. As a part of the Safety Element, it is related to Emergency Preparedness Element and others. Primary issues addressed in this sub-element include hazards management and the transport, storage, use, and disposal of hazardous materials and waste, and the release of hazardous materials during construction and manufacturing. Hazards may also include exposure to safety and high noise levels associated with aircraft operations at nearby airports. Management of the hazardous materials is important and necessary to protect the community and the environment. As urban growth continues in the City, it becomes increasingly important to safely manage hazardous materials.

BACKGROUND

One of the principal objectives of the General Plan is to protect the community from exposure to environmental hazards, including hazardous materials, by minimizing associated health risks and ensuring that use of hazardous materials does not adversely affect environmental resources. The policies and programs set forth in this sub-element are intended to assure effective and safe use, storage, and transport of hazardous and toxic substances in the City.

Government Code Section 65302(g) requires that General Plans include policies and programs that minimize the exposure of the community to hazardous materials. Responsibility for regulating and monitoring the management, disposal, labeling, and use of toxic and hazardous materials lies with a variety of federal, state, county and local agencies, including the U.S. Environmental Protection Agency, the California Office of Health Planning and Development, and the Riverside County Department of Environmental Health Certified Unified Program Agencies. AB 2948 (Chapter 1504, Statutes of 1986), commonly known as the Tanner Bill, authorizes counties to prepare Hazardous Waste Management Plans (HWMP) in response to the need for better management of hazardous materials and waste products. The California Regional Water Quality Control Board (CRWQCB), as well as DWA and CVWD, maintains information concerning contaminated water wells and groundwater.

Hazardous Materials Defined

Under Title 22 of the California Code of Regulations (CCR), the term hazardous substance refers to both hazardous materials and hazardous wastes that are classified according to four properties: toxicity, ignitability, corrosiveness, and reactivity (CCR Title 22, Chapter 11, Article 3). According to Title 22, "*A hazardous material is defined as a substance or combination of substances that may cause or significantly contribute to an increase in serious, irreversible, or incapacitating illness or may pose a substantial presence or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.*" Products as diverse as gasoline, paint solvents, film solvents, chemicals associated with cannabis products manufacturing, pool chemicals, household cleaning products, refrigerants, and radioactive substances are categorized as hazardous materials.

State and federal agencies regulate hazardous materials. The Hazardous Waste Control law (Chapter 6.5 of Division 20 of the Health and Safety Code) and Title 26 of the California Code of Regulations list more than 800 potentially hazardous materials and establish criteria for identifying, packaging, and disposing of such wastes. Under these regulations, the generator of hazardous waste material must complete a manifest that accompanies the material from the point of generation to transportation to the ultimate disposal location, with copies of the manifest filed with State Department of Toxic Substance Control.

Hazardous Materials Management and Transport

One of the City's primary concerns is that businesses are housed in buildings which are properly rated for their level of hazardous material use. Proper housing of hazardous materials is enforced through the Hazardous Material Disclosure Program[17], which is administered by the Riverside County Department of Environmental Health. Under this program, businesses are required to identify the type and quantity of the hazardous materials they handle. This information is updated each year and Environmental Health carries out site inspections to determine compliance with the company's business plan and applicable regulations. The City Emergency Manager maintains a copy of the list of these businesses. In 2018, there are 36 locations in the Cathedral City that are categorized as LUST Cleanup Site, Land Disposal Site, or Permitted Underground Storage Tank (UST). These sites are regulated by the Riverside County Department of Environmental Health.

Hazardous materials are transported on the City's roads and freeways, as well as on UPRR lines. Both the East Palm Canyon Drive/Highway 111 and Interstate-10 and Union Pacific Railroad corridors cross through the City and are used for transporting chemicals, flammable fuels, wastes and other potentially hazardous materials. East Palm Canyon Drive and Interstate-10 are principal east-west thoroughfares where trucks carry these materials. Date Palm Drive, Landau Boulevard, Dinah Shore Drive, Ramon Road, and Vista Chino are on truck routes that could be used for hazardous materials transportation.

The City's Fire Department and the Riverside County Fire Department Hazardous Materials Response Team respond to all hazardous material incidents within Cathedral City. The California Highway Patrol responds to spills on Interstate-10 and works in conjunction with local authorities to manage traffic diversion and any off-highway effects.

Hazardous Waste and Sewage Disposal

Over the past several decades, an area of concern in the Coachella Valley and the Cathedral City area has been the impact of long-term septic tank use on groundwater resources. Contamination problems have not been particularly evident, although impacts on the lower portions of alluvial cones with extensive upslope residential development are areas where septic tank effluents have affected groundwater. Monitor wells in the Cathedral Cove area have shown elevated levels of nitrate and other contaminants; however, the recent extension of sewage collection system throughout the Cove has reduced the effects of on-lot septic systems on local groundwater.

HAZARDOUS WASTE MANAGEMENT PLANS

Riverside County Hazardous Waste Management Plan

AB 2948 (Chapter 1504, Statures of 1986), commonly known as the Tanner Bill, authorizes counties to prepare Hazardous Waste Management Plans (HWMP) in response to the need for safe management of hazardous materials and waste products. Originally adopted by the County and approved by the state in 1990, the County HWMP was established to identify the types and amounts of wastes generated in the County and enact programs for managing these wastes. The HWMP identifies the type and quantity of hazardous waste generated in the County. It projects future quantities likely to be generated, and includes goals, policies, and standards for the management of hazardous waste. Also, the HWMP establishes procedures for the siting of new hazardous materials treatment, storage, and disposal facilities.

[17] Riverside County Department of Environmental Health.

HWMP policies require the County to coordinate its efforts with state and federal agencies in the identification and establishment of programs for managing these wastes. As an integral part of the County HWMP, the City hazardous waste management policies of the General Plan are basically extensions of the County Plan and are hereby incorporated by reference.

Countywide Integrated Waste Management

The Countywide Integrated Waste Management Plan (CIWMP) was prepared in accordance with the California Integrated Waste Management Act of 1989, Chapter 1095 (AB 939). AB 939 redefined solid waste management in terms of objectives and planning responsibilities for local jurisdictions and the state. AB 939 requires each of the cities and unincorporated portions of counties throughout the state to divert a minimum of 25% of the waste stream by 1995 and 50% of the solid waste landfilled by the year 2000. To attain these goals for reductions in disposal, AB 939 established a planning hierarchy utilizing new integrated solid waste management practices.[18] The Riverside County revises the CIWMP every five years and publish a Five-Year Review Report to assure that the County's waste management practices remain consistent with the hierarchy of waste management practices. The City has developed a *Refuse and Recycling Guide* to further waste diversion.

Cathedral City's Local Hazard Mitigation Plan

Cathedral City coordinates with appropriate county, state and federal agencies in the identification of hazardous material sites, and the active regulation of their timely cleanup. Management strategies include establishing and maintaining information on impact sites, and periodic monitoring of facilities and operations that produce, utilize or store hazardous materials in the city. Involvement in multi-agency monitoring of illegal dumping in the City, conferring in the regulation of underground storage tanks and septic systems, and regulating the transport of hazardous materials through the community is coordinated by the Engineering and Public Works Department.

In compliance with AB 2140, the City prepared its first Local Hazard Mitigation Plan (LHMP) in 2012. The purpose of the LHMP is to integrate hazard mitigation strategies into the City's daily activities and programs. The LHMP assesses risk from earthquakes, transportation accidents, transportation system loss, wild land/urban interface fires, terrorism, nuclear accidents, utility loss or disruption, water and wastewater disruption, hazardous materials incidents, information technology loss or disruption, severe weather, explosions, economic disruption, floods, drought, dam failure, and special events. The LHMP for the City of Cathedral City planning area was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA's Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled. The people and facilities at risk are analysed, and mitigation actions are developed to reduce or eliminate hazard risk. The implementation of these mitigation actions, which include both short and long-term strategies, involving planning, policy changes, programs, projects, and other activities, is hereby incorporated into the General Plan Safety Element and the 2040 Hazards and Hazardous Materials Sub-Element (http://www.cathedralcity.gov/home/showdocument?id=6670).

Household Hazardous Waste

Residential use of household chemicals, automobile batteries and used oil, paint and similar materials result in hazardous waste and the need for its safe and responsible disposal. The County offers a number of services for the disposal of residential hazardous wastes. These include the "ABOP" (Antifreeze, Batteries, Oil and Latex Paint) site, located at the Palm Springs Fire Department Training Center in Palm Springs, which will dispose of these materials for residential users. The facilities will take up to 5 gallons or 50 pounds of materials per trip, and all materials must be clearly marked and sealed. The site is open every Saturday, and will only take materials from individuals. No business wastes are accepted.

[18] Riverside County Department of Waste Resources.

Hazardous Materials Emergency Response

Pursuant to the Emergency Services Act, California has developed an Emergency Response Plan to coordinate emergency services provided by Federal, State, and Local governmental agencies and private persons. Response to hazardous materials incidents is one part of this plan, which is administered by the State Office of Emergency Services (OES). The OES coordinates the responses of other agencies, including the US Environmental Protection Agency (EPA), California Highway Patrol (CHP), California Department of Fish and Wildlife (CDFW), the Regional Water Quality Control Board's (RWQCB), the local air quality management districts (in this case, the South Coast Air Quality Management District (SCAQMD)), and local agencies.

As a part of its emergency mitigation and outreach program, Cathedral City maintains fire safety programs in schools and throughout the year at special community events. The City Fire Department maintains Mutual Aid Agreements for fire and emergency medical services with the Riverside County Fire Department and the Palm Springs Fire Department. (see Riverside County OA MJHMP). The Fire Department hosts Community Emergency Response Training (CERT) and Teen CERT to the public, regardless of their residency status in Cathedral City.

FUTURE DIRECTIONS

Cathedral City will continue to coordinate with the appropriate agencies in the identification of hazardous material sites, and the active regulation of their timely cleanup. A long-term goal of the Local Hazard Mitigation Plan is to assimilate mitigation strategies into the City's day-to-day functions, and to periodically update the plan as needs, regulations and capabilities evolve. This element sets forth general goals, policies and programs that extend and reference the LHMP and other emergency coordination programs addressing community hazards and hazardous materials.

GOAL, POLICIES AND PROGRAMS

Goal 1: A community and environment that is safe from the threat of hazardous conditions and hazardous and toxic materials.

Policy 1: Utilizing the resources available through the County of Riverside and the Regional Water Quality Control Board, maintain current data on hazardous materials users within the planning area.

Program 1.A: Update the City's data on hazardous materials users quarterly, by regularly contacting the County Department of Environmental Health and the Regional Water Quality Control Board and reviewing online databases or lists.
Responsible Agencies: Fire; County Environmental Health; Regional Water Quality Control Board
Schedule: Continuous

Program 1.B: Coordinate with responsible agencies to assure enforcement of state and federal regulations for the testing and monitoring of underground fuel storage tanks for leakage.
Responsible Agencies: Public Works; Planning; Fire Department; State and US EPA; County Health
Schedule: Continuous

Program 1.C: A Conditional Use Permit (CUP) shall be required for all new development that generates, transports, or stores hazardous materials and shall be so reflected in the City's Zoning Ordinance.
Responsible Agencies: Planning, Fire
Schedule: Continuous

Policy 2: Encourage and facilitate the adequate and timely cleanup of existing and future contaminated sites within the City and its sphere-of-influence.

> **Program 2.A:** Coordinate with responsible county, state and federal agencies to activate cleanup procedures, and monitor the status of cleanup efforts on an ongoing basis.
> **Responsible Agencies**: Fire; State and federal EPA; County Health Department; CRWQCB
> **Schedule**: Continuous

Policy 3: The City shall thoroughly evaluate development proposals for lands directly adjacent or in proximity to sites know to be contaminated with hazardous or toxic materials.

Policy 4: The City shall designate appropriate access routes to facilitate the transport of hazardous and toxic materials and wastes.

> **Program 4.A:** Coordinate with the Fire Department, Police Department, neighboring jurisdictions, and other appropriate agencies to identify segments of highway or local roads that shall be restricted from transporting hazardous and toxic materials.
> Responsible Agencies: Planning; Fire, Police
> Schedule: Continuous
>
> **Program 4.B**: Enforce roadway access restrictions and consider the implementation of fines or penalties for violations.
> Responsible Agencies: Public Works; Fire, Police
> Schedule: Continuous

Policy 5: The Fire Department shall maintain a citywide Emergency Operations Plan, which provides for emergency services in the event of a hazardous spill or airborne release.

Policy 6: Encourage households and small businesses to dispose of hazardous and toxic wastes in accordance with county, state, and federal regulations.

> **Program 6.A:** Continue to distribute information materials provided by the County and the Regional Water Quality Control Board regarding proper management and disposal of household hazardous and toxic wastes, and also post information on the City web site.
> Responsible Agencies: Environmental Conservation Manager, County Environmental Health
> Schedule: Immediate; Continuous
>
> **Program 6.B:** Implement the Household Hazardous Waste Element (HHWE) as prepared by the Coachella Valley Association of Governments (CVAG) and its member cities.
> Responsible Agencies: Engineering, Public Works
> Schedule: Immediate; Continuous

Policy 7: The City shall actively oppose plans for hazardous or toxic waste dumps, landfills, or industrial processes that may potentially adversely affect the City and its Sphere-of-Influence, and shall participate in the identification of alternative sites.

Policy 8: Confer and coordinate with the CVWD, DWA, and the California Regional Water Quality Control Board in the regulation, monitoring, and phased removal of subsurface sewage disposal systems.

> **Program 8.A:** The development review process shall be used to assure that all new development connects to the sewage collection systems of the Coachella Valley Water District and Desert Water Agency where that service is available.
> Responsible Agencies: Planning, Public Works; DWA; CVWD
> Schedule: Continuous

Policy 9: The travel route for the transport of hazardous materials and wastes shall have adequate capacity to safely accommodate additional trucks and shall avoid the residential areas.

Policy 10: Hazardous sites susceptible to leak or collapse during earthquakes shall be identified.

Policy 11: The location and number of the hazardous facilities close to the schools, hospitals, and residential areas shall be regulated properly and introduce buffer zones between the hazardous facilities and sensitive facilities and/or receptors.

Policy 12: The City shall minimize exposure to hazardous substances where ever possible.

Policy 13: Encourage and promote practices in the community to reduce the use of hazardous materials and the generation of hazardous waste at their source, recycle the remaining hazardous wastes for reuse, and treat those wastes which cannot be reduced at the source or recycled.

Policy 14: Engage the community in overseeing remediation of toxic sites. Promote the permitting and monitoring of potentially hazardous industrial uses. Develop a response plan to address existing contaminated sites in the city.

Policy 15: The City shall support reductions in the use of hazardous fuels to minimize their impacts to the human health and environment.

Emergency Preparedness Sub-Element

PURPOSE

The purpose of the Emergency Preparedness Sub-Element is to provide information on emergency response services and plans currently (2018) in effect. It outlines critical facilities and services necessary to respond adequately to emergencies, and discusses potential impacts of natural and man-made threats which could significantly affect the City. Finally, the Sub-Element sets forth the goals, policies and programs that have been developed by the City to ensure adequate preparation for and response to such emergencies, and to minimize human and economic losses.

BACKGROUND

This Sub-Element is included as part of the overall discussion and planning regarding general environmental hazards and is in accordance with Government Code Section 65302(g), which mandates that General Plans address hazards such as seismic disturbances and their effects, and "other geologic hazards ... flooding; and wildland and urban fires." As an integral part of the Safety Element and its other sub-elements, the Emergency Preparedness Sub-Element is related to other elements, including Circulation and Mobility, and Public Services and Facilities.

As discussed throughout the Safety Element, the City and its planning area are subject to a variety of environmental conditions and hazards that can precipitate a local, city-wide or region-wide emergency. These conditions include high seismicity and associated hazards, local and regional flooding, high and erosive winds, major rail and highway facilities and associated accident potential, and other land uses and activities that could prompt an emergency response.

Emergency Scenarios

Portions of the City are crossed by the San Andreas Fault Zone and are vulnerable to seismically-induced ground shaking, ground rupture, slope failure, rockfalls and landslides, ground subsidence and soils liquefaction. These seismic hazards and related structure damage, as well as urban wildfires, flooding, and hazardous materials releases all require emergency planning. The potential for man-made emergencies, such as power outages, major accidents involving trains, motor vehicles or aircraft, also exists. More current concern over urban terrorism and increasing incidents of school shootings and other forms of violence, may also necessitate an emergency response.

"By failing to prepare we are preparing to fail."

"An ounce of prevention is worth a pound of cure."
Benjamin Franklin

"There is no harm in hoping for the best as long as you're prepared for the worst."
Stephen King

Inter-Agency Coordination

On a regular and ongoing basis, Cathedral City consults and coordinates with the Riverside County Emergency Management Department (EMD), which tasked with developing and implementing new and better ways to solve issues and adapt to future changes in the fields of emergency management and emergency medical services in the City and regionally.[19] Riverside County EMD works alongside the California Office of Emergency Services (Cal OES), and is a part of Cal OES Region VI,[20] which consists of the counties of Riverside, San Bernardino, Imperial, Inyo, Mono, and San Diego. The Operational Area (OA) is the intermediate level of the State's emergency services organization and is made up of County government, local (city) governments, school districts, and special districts located within the Riverside County area.

19 County of Riverside Emergency Management Department Annual Report (2016).
20 California Office of Emergency Services (Cal OES) Fire and Rescue Division – Regional Assistant Chief Map (2018).

During a State of Emergency, a State of War Emergency, or a Local Emergency, the OA is required to coordinate resources, priorities, and information, as well as serve as a coordination and communication link to the State Mutual Aid System. OA activities include coordinating information, resources, and priorities between the regional level at the Governor's Office of Emergency Services and the local government level.

The County Emergency Management Department also manages the Regional Disaster Medical Health Coordinator (RDMHC) Program for Region VI. Promulgated under the California Health and Safety Code, the RDMHC program is tasked with the management of regional; medical and health mutual aid, mutual cooperation amongst the counties, coordination of medical and health resources, and support for County Medical and Health Operational Area Coordinator programs.

The RDMHC program provides staff to support the Regional Disaster Medical Health Coordinator (RDMHC) and supplements the State medical and health response system through the development and sharing of information and emergency management systems. The RDMHC Program has improved the Southern Region Medical and Health Communications Directory by adding satellite phone numbers and addressing radio communications compatibilities to increase redundant communications in the region.

Community Emergency Response Training (CERT)

Cathedral City participates in the Federal Emergency Management Agency's (FEMA) Community Emergency Response Training (CERT) program, which is a series of classes that educate and train residents to effectively address dangerous situations if emergency services are delayed in responding. In the CERT program, citizens learn to manage utilities and put out small fires, perform CPR, control bleeding, and provide basic medical aid and treatment for shock. CERT trainees are also trained to search for and rescue victims safely, organize themselves and volunteers to be effective, and collect disaster intelligence to support first-responder efforts. Additional educational resources are provided to the public via disaster-preparedness presentations, flyers, and a web site and information-retrieval system.

Emergency Preparedness and Climate Resilience

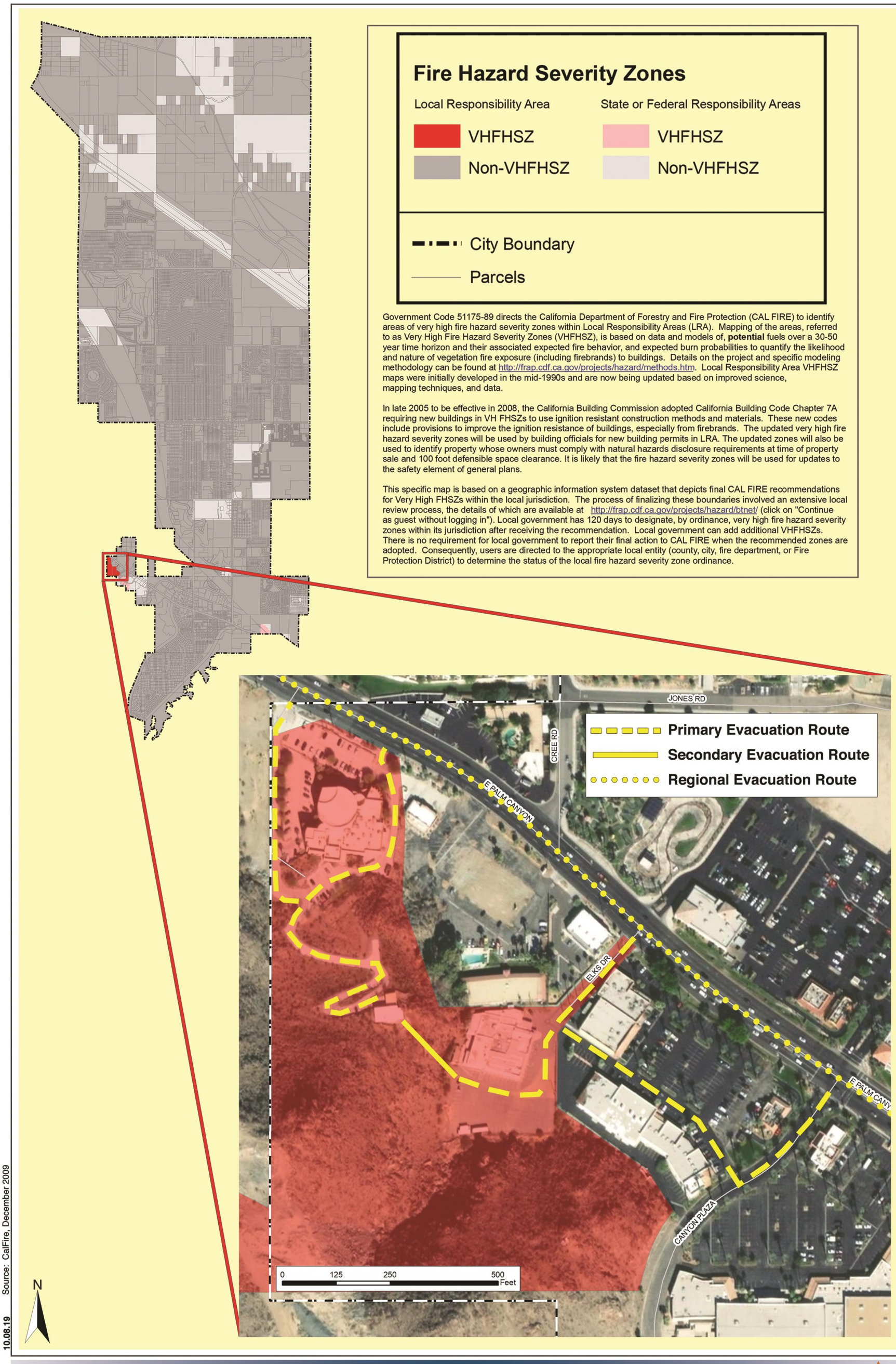
In accordance with the requirements of SB 379, codified in Government Code section 65302(g)(4), climate change adaptation and resilience must be addressed in the safety element of all general plans in California. A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts is also required. Climate changes has increased Cathedral City's exposure to wildland fires, although this threat appears to be limited by the low fuel levels in open space areas and elevated terrain. Between 2000 and 2018, only one wildland fire (12.2± acre Cathedral Fire, 2008) occurred in or near the City. Most wildland fires in the western Coachella Valley are associated with upper elevation slopes of the San Jacinto Mountains to the west. The City has until 2022 to develop climate adaptation and resiliency strategies, goals, policies, and implementation programs based on the information specified in the Government Code for the protection of the community. The City's Local Hazard Mitigation Plan recognizes and plans for such climate-related emergencies as drought, extreme weather and wind events, and power outages. The City's Climate Action Plan and the Local Hazard Mitigation Plan satisfy the requirements of SB 379. Also see the *Air Quality and Climate Stability Element.*

Environmental Risks

Cathedral City is located in an area that is susceptible to a variety of potential disasters, including earthquakes, flooding, wind, and extreme weather. Preparing for emergencies and disasters and having pre-planned procedures to coordinate a strategic response is not only important for government agencies, but also for local residents and businesses. Emergency preparedness ensures that government agencies, residents, and businesses have made the necessary plans and secured the necessary equipment and resources to stay safe during a disaster and to survive without regular services (such as water and electricity) during the recovery phase. Risks and vulnerabilities identified in the City's Local Hazard Mitigation Plan are given below.

Table S-2
Hazards and Severity

Hazards	Description	Ranking 1 = High / 4 = Low		Ranking
		Severity	Probability	1-19
Earthquake	The City is located in a severe seismic hazard zone and could be exposed to severe ground shaking.	2	3	1
Flood	Heavy rain in and around Cathedral City continues to lead to problems with storm drainage and creates localized flood problems.	3	1	2
Wildland fire		3	1	12
Other Natural Hazards				
Drought	The City's risks or vulnerabilities from drought do not differ from the rest of the valley.	2	4	6
Landslides		1	2	4
Insect Infestation		3	4	13
Extreme Summer/Winter Weather	Entire City would be subject to extreme heat; therefore, the City has a cooling station plan to be located at Salvation Army, Library and Senior Center.	3	4	5
Severe Wind Event	Entire City is subject to extreme wind events with gusts as high as 50 mph; the northern most portion of Cathedral City experience the greatest winds. These events cause hazards in downed power lines, snapped power poles, downed trees, and poor visibility caused by blow-sand.	2	1	3
Agricultural				
Disease/Contamination	Not applicable.	2	2	16
Terrorism		1	2	15
Other Man-made				
Pipeline		2	2	11
Aqueduct		0	0	19
Transportation		2	3	8
Power Outage		3	3	6
Hazmat Accidents		2	3	7
Nuclear Accident		0	0	18
Terrorism		2	2	9
Civil Unrest		2	2	10
Jail/Prison Event		1	1	17
Medical				
Pandemic				14
Source: Cathedral City's Local Hazard Mitigation Plan (2017)				


Fire Hazard Severity Zones
Local Responsibility Area
VHFHSZ
Non-VHFHSZ
State or Federal Responsibility Areas
VHFHSZ
Non-VHFHSZ
City Boundary
Parcels
Government Code 51175-89 directs the California Department of Forestry and Fire Protection (CAL FIRE) to identify areas of very high fire hazard severity zones within Local Responsibility Areas (LRA). Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on data and models of, potential fuels over a 30-50 year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to buildings. Details on the project and specific modeling methodology can be found at http://frap.cdf.ca.gov/projects/hazard/methods.htm. Local Responsibility Area VHFHSZ maps were initially developed in the mid-1990s and are now being updated based on improved science, mapping techniques, and data.
In late 2005 to be effective in 2008, the California Building Commission adopted California Building Code Chapter 7A requiring new buildings in VH FHSZs to use ignition resistant construction methods and materials. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated very high fire hazard severity zones will be used by building officials for new building permits in LRA. The updated zones will also be used to identify property whose owners must comply with natural hazards disclosure requirements at time of property sale and 100 foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.
This specific map is based on a geographic information system dataset that depicts final CAL FIRE recommendations for Very High FHSZs within the local jurisdiction. The process of finalizing these boundaries involved an extensive local review process, the details of which are available at http://frap.cdf.ca.gov/projects/hazard/btnet/ (click on "Continue as guest without logging in"). Local government has 120 days to designate, by ordinance, very high fire hazard severity zones within its jurisdiction after receiving the recommendation. Local government can add additional VHFHSZs. There is no requirement for local government to report their final action to CAL FIRE when the recommended zones are adopted. Consequently, users are directed to the appropriate local entity (county, city, fire department, or Fire Protection District) to determine the status of the local fire hazard severity zone ordinance.
JONES RD
CREE RD
E PALM CANYON
ELKS DR
CANYON PLAZA
Primary Evacuation Route
Secondary Evacuation Route
Regional Evacuation Route
0
125
250
500
Feet
N
Source: CalFire, December 2009
10.08.19
TERRA NOVA®
PLANNING & RESEARCH, INC.
Exhibit S-7 - Fire Hazard Zones Map
Cathedral City 2040 General Plan
Cathedral City

CRITICAL FACILITIES

Critical facilities such as hospitals, police and fire stations, governmental operations, communications centers and utility facilities form a vital network implementing emergency preparedness plans in the event of a natural disaster or other emergency. Support facilities, such as fire and police communications, auxiliary personnel and commercial radio stations, can support the primary critical facilities by providing information and direction to the public during a crisis. The City also relies on the Radio Amateur Civil Emergency Services (RACES) organization for amateur radio communications county-wide during a disaster, which is a protocol created by the FEMA and the Federal Communications Commission (FCC Part 97, Section 407).

Emergency access, including evacuation routes and routes for the transport of the injured, peak-load water supply and delivery, and airport services must also be considered. It is important to take into account transportation system constraints, which may hinder ground-based access or delivery of supplies and emergency services to the affected areas.

Number of the critical facilities and infrastructure within the Cathedral City is given below:

Table S-3
Critical Facilities in the City

Critical Facilities Type	Numbers
Public Safety Dispatch	1
Emergency Operations Center	2
City Hall	1
Fire Stations	3
Water Reservoirs	6
Water Treatment Plants	0
Waste Water Treatment Plants	0
Health Care Facilities	4
Police facility	1
Maintenance Yards	1
Senior Community Centers	3
Schools	10
Radio Repeaters	2
Source: Cathedral City's Local Hazard Mitigation Plan (2017)	

EMERGENCY ACCESSIBILITY AND TRANSPORTATION

Immediate access to impacted areas by emergency personnel and supplies is essential after a disaster. East Palm Canyon Drive, Dinah Shore Drive (Mid-Valley Parkway), Ramon Road, Date Palm Drive and US Interstate-10 are major intercity and regional access routes serving Cathedral City. These arteries, including their bridges and overpasses, could be blocked or damaged in the event of a major disaster, including major earthquakes or floods, urban wildfires, major truck or rail accidents, or by other natural or manmade disasters. The loss of freeway overpasses, bridges over the Whitewater River, or the closing of roads due to rockfalls or landslides would each impede the delivery of emergency services and supplies.

The City is generally well protected from major flooding by extensive drainage facilities, including levees and channels adjacent to the Santa Rosa Mountains and passing through the City. All-weather crossings over the Whitewater River currently exist at Date Palm Drive, Ramon Road and Dinah Shore Drive. and East Palm Canyon Drive crosses the East and West Cathedral Canyon Washes. Planned all-weather crossings include the Cathedral Canyon Drive and Vista Chino bridges, which will provide additional all-weather crossings of the Whitewater River. Other parts of the City are susceptible to major flooding and possible isolation from major transportation links and the rest of the community. Lands at the west end of the City, and north and south of East Palm Canyon Drive, are located in an AO flood zone with possible inundation depths of one to three feet. In the northern portion of the City, lands north and south of I-10 are also susceptible to major flooding, which could affect access and isolate these lands from emergency services.

The City shall continue to coordinate with Caltrans, the Federal Highway Administration, CVAG, adjoining cities and Riverside County, as well as Sunline Transit Authority, to provide the highest functional reliability of major roadways and the public transportation system serving the City and the region. The City shall also continue to coordinate with Riverside County Flood Control, the Coachella Valley Water District (CVWD) and the Federal Emergency Management Agency (FEMA) to address continuing flooding hazards that threaten people and property, and which may isolate portions of the community during disasters. Programs shall be developed to identify and address weak links in the circulation system, in conjunction with the efforts of other Coachella Valley jurisdictions.

EMERGENCY MEDICAL SERVICES AND FACILITIES

City Fire Department and EMS

Emergency medical services are provided by the City Fire Department and include paramedic services on-site and during emergency transport. Backup services are provided by the private provider American Medical Response (AMR) in the City and valley. AMR maintains a ring-down communication line with City Fire Department dispatchers and has ambulances staffed with Emergency Medical Service personnel (paramedics). AMR can link with California Highway Patrol to provide airlift capabilities based out of the Thermal Airport, and with Mercy Air, which operates out of Banning. The Palm Springs International Airport is located within 5 miles of most portions of Cathedral City and provides an important access point for helicopter and fixed-wing aircraft.

Local Hospitals

There are three valley hospitals (Eisenhower Medical Center, Hospital and Desert Regional Medical Center) and John F. Kennedy Memorial that can provide care and personnel in the event of an emergency in the Cathedral City. These are located at:

Eisenhower Medical Center
39000 Bob Hope Drive
Rancho Mirage, CA 92270

Desert Regional Medical Center
1150 N Indian Canyon Drive
Palm Springs, CA 92262

John F. Kennedy Memorial Hospital
47111 Monroe St
Indio, CA 92201

These three hospitals provide emergency medical services with 24-hour emergency rooms but differing levels of service. Eisenhower Medical Center and Desert Regional Medical Center have 550 and 369 beds, respectively. Only Desert Regional Medical Center has a trauma care center, a Level II Trauma Center certified by California Emergency Medical Services. John F. Kennedy Memorial Hospital currently has 145 beds Also see the *Public Services and Facilities Element*.

EMERGENCY RESPONSE & ORGANIZATIONAL STRUCTURE

Cathedral City's emergency responders, including Fire and Police services, cooperate and coordinate closely with other valley cities and the County on an on-going basis. In the event of a local or valley-wide emergency, agency cooperation, coordination and joint emergency simulations are essential to providing continuity of basic services and to manage large-scale emergency operations.

The City's Emergency Operations Plan (EOP, 2015) is based on the functions and principles of the National Incident Management System (NIMS) and the Standardized Emergency Management System (SEMS), which is based on the FIRE SCOPE Incident Command System (ICS). SEMS is the cornerstone of California's emergency response system and the fundamental structure for the response phase of emergency management. The system unifies all elements of California's emergency management community into a single integrated system and standardizes key elements. The City's Emergency Operations Plan addresses emergency planning, organization, and response policies and procedures. It also addresses the integration and coordination of the City with other governmental levels when required.

State and national organizations, such as the American Red Cross and the National Guard, have specific roles in emergency management. American Red Cross provides emergency assistance to families and communities in disasters, such as earthquake, fire, or flood, providing assistance with shelter, clothing, medical supplies, mental health counseling, and other emergency needs. It also provides disaster and first aid supplies.

The National Guard provides supporting emergency response to battle fires and help communities deal with floods, tornadoes, hurricanes, snowstorms or other emergencies. The Guard also provides emergency services during the times of civil unrest within communities, state or nation. The State National Guard will primarily serve as a peace-keeping or security force, unless required to function otherwise by an emergency declaration by the President of the United States. Should a large-scale regional or state-wide emergency require airlifting of stable injured individuals out of the State to make room for more severely injured, less mobile persons, the National Guard has the capability to provide that service.

Emergency Operations Center

The City of Cathedral City Emergency Operations Center (EOC) is located at Fire Station 412 at 32100 Desert Vista Road, just south of Ramon Road. It provides a location, facilities and staffing that allows a coordinated central command and control of the emergency response. The EOC is responsible for strategic direction and operational decisions, and does not typically directly control field assets, instead leaving tactical decisions to lower commands. Common EOCs functions include data and information collection and analyze; making decisions that protect life and property, maintaining continuity of the response. Professional staff and communications assets are the primary components of the EOC.

City Emergency Response Programs

The City's *Fire Suppression Program* is designed to reduce injuries, deaths, environmental damage, and property losses due to medical emergencies, fires, hazardous materials incidents, and physical and natural disasters within the City. Fire suppression personnel perform public education programs, company fire prevention inspections, and cause and originate investigations to prepare the City and community for emergencies and/or disasters. They also maintain all emergency response apparatus, equipment and facilities on a daily basis. The City's *Paramedic Services Program* provides advanced life support and emergency ambulance transport services. The City's *Disaster Preparedness Program* provides for the needs of the community before, during and after a disaster, including the CERT program, EOC equipment and supplies, and staff training.

FUTURE DIRECTIONS

Cathedral City has devoted substantial resources to its disaster preparedness efforts and is ensuring that response plans and systems are maintained and upgraded to keep pace with population growth, new construction, business development, and growth-induced circulation issues. The City must also consider that the expansion of its planning area requires extension of emergency services to areas north of US I-10, which could be cut off from the rest of the City in a major flood or earthquake.

The City's emergency management efforts must continue to include educating residents about their need to prepare household emergency plans and to stockpile supplies, which will render them self-sufficient for a period of at least 72 hours during an emergency. The City must remind homeowners of this challenging task, as other daily priorities and concerns quickly overtake the initial sense of urgency immediately following an emergency. This initiative is a part of the City's planning and the City should continue to develop and implement this program.

The City shall continue to work with neighborhood and homeowner associations to assist in their establishment and use of the CERT structure, and provide pre-appraisal of the development's facilities, on-site triage and first aid training, and education about initial responses to emergencies and supplies needed. The City may also want to explore offering incentives to increase the number of residents and neighborhoods participating in CERT, as such participation would effectively reduce immediate strain on City resources during an emergency.

Nursing homes, licensed day care facilities and private schools, all of which serve potentially vulnerable populations, are required to develop disaster plans. However, since these are non-public agencies, they may not be part of established communications networks or back-up systems. Following an earthquake, the City will conduct basic damage assessments of nursing home facilities, but resources may not allow more than a preliminary status check. A more established planning system, which would incorporate skilled nursing facilities into the CERT program, should be explored. It is also critical that the staff at such facilities is fully educated regarding what resources and chain of communication they can access in the event of emergencies.

Private schools and licensed day care facilities should also be included in a comprehensive education and information program, which trains them regarding available resources and also encourages them to adequately prepare for potential disasters. The City shall also coordinate department heads and other staff to ensure that disaster planning for City facilities is current, workable and that appropriate personnel are adequately informed regarding coordination of disaster planning and appropriate responses to emergencies affecting City facilities. The City shall ensure adequate resources are dedicated to identifying and cross-training additional staff to strengthen the City's in-house emergency response and allow for expansion of services to improve contingency planning with all sectors of the community.

GOALS, POLICIES AND PROGRAMS

Goal 1: A detailed, integrated and effective emergency preparedness plan for the City ensuring a high level of readiness and responsiveness to man-made and natural disasters of any scope, and which maximizes response capabilities of the City, County, State and Federal governments.

> **Policy 1:** The City shall give priority to maintaining and updating of all hazard summaries and responses of the Local Hazard Mitigation Plan and the Emergency Operations Plan.
>
> > **Program 1.A:** The City shall periodically review and update the Local Hazard Mitigation Plan and the Emergency Operations Plan, including but not limited to fire protection, law enforcement, communications, alternative access, public health services, damage assessment and other emergency response parameters of Emergency Operations Plan.
> > **Responsible Agency:** Fire, Police, All Other City Departments
> > **Schedule**: On-going; Comprehensive update minimum once every five years

Policy 2: The City emergency response plans shall recognize and accommodate the physical, environmental and other conditions that could pose potentially significant hazards, and shall take proactive steps to minimize these threats to the community's residents, businesses, visitors and economy.

Program 2.A: The City shall evaluate the full range of physical and other constraints to the effective implementation of the Emergency Operations Plan, shall develop or update strategic planning to address and minimize the effects of these constraints, and periodically report to the City Council on progress made in addressing these constraints.
Responsible Agency: Engineering, Public Works, Fire, Police, Riverside County Emergency Management, Other City Departments
Schedule: Annual Report

Program 2.B: The City shall coordinate with responsible flood control agencies and shall jointly develop long-term strategies and capital improvement plans that, to the extent practicable, eliminate or minimize significant flooding hazards which threaten lives, property and emergency access.
Responsible Agency: Engineering, Public Works, County Flood Control, CVWD
Schedule: 2019-2020; Update every five years

Program 2.C The City shall ensure that responsible domestic water providers comply with State requirements for water storage and distribution systems to withstand strong ground shaking and other seismic hazards.
Responsible Agency: Engineering, Public Works, Desert Water Agency, CVWD
Schedule: Ongoing

Policy 3: The City shall identify and establish emergency evacuation and supply routes and plans to preserve or reestablish the use of East Palm Canyon Drive, Date Palm Drive, Dinah Shore Drive, Ramon Road, Vista Chino, Interstate-10 and other essential transportation routes.

Program 3.A: Establish and appoint a staff liaison with adjoining cities, Riverside County, CVAG and Caltrans to facilitate the designation of emergency evacuation and supply routes, and for the development of a multi-agency emergency response plan that provides expeditious and timely repair to major streets and highways damaged by earthquakes, flooding or other disasters.
Responsible Agency: City Manager, Engineering, Public Works, Neighboring Cities, Riverside County Emergency Management, Caltrans, CVAG
Schedule: 2019; Continuous

Policy 4: Formal lines of communication shall be established and maintained between the City, County Geologist, and the US Geological Service and/or the California Institute of Technology to assure the provision of earthquake predictions and alerts that may help minimize impacts to the City and surrounding area.

Program 4.A The City shall coordinate with the County Geologist and contact Caltech and the appropriate office of the US Geological Survey and establish a liaison and procedures by which these organizations contact and inform the City of updated earthquake predictions that may affect the community.
Responsible Agency: Fire, Police, County Geologist, USGS
Schedule: 2019; Continuous

Program 4.B Once available, the City shall take part in the *ShakeAlert* program developed by the US Geological Service, which will issue public warnings of potentially damaging earthquakes and provide warning parameter data to the City and other government agencies, and private users on a region-by-region basis.
Responsible Agency: Fire, Police, USGS
Schedule: 2019; Continuous

Policy 5: The City shall cooperate and coordinate with Riverside County Emergency Management, local utilities purveyors and other agencies and utilities in the preparation and distribution of public information materials to assist residents, visitors and business owners on how to prepare for and respond to local disasters and emergencies.

Program 5.A: Coordinate and cooperate with Riverside County Emergency Management, Desert Water Agency, CVWD, Southern California Edison, Southern California Gas, and other agencies and utilities in the development and dissemination of information and instructions on appropriate actions in the event of a local disaster or emergency.
Responsible Agency: Police, Riverside County Emergency Management, SCE, SCG, DWA, CVWD
Schedule: 2019; Continuous

Program 5.B: Coordinate with local schools and appropriate public and quasi-public agencies to ensure that they are adequately prepared for and are a part of a city-wide and regional emergency response when disaster strikes.
Responsible Agency: Fire, Palm Springs Unified School District
Schedule: 2019; Continuous

Policy 6: The City shall thoroughly consider and assess vulnerability to natural and manmade disasters or emergencies when reviewing proposals for the siting and development of critical and essential public/quasi-public facilities.

Program 6.A: In order to assure the maximum possible protection from environmental and manmade hazards, including earthquakes and flooding, the City shall consider vulnerability to natural and manmade disasters and emergencies when reviewing proposals for critical and essential facilities, as well as sensitive land uses.
Responsible Agency: Planning, Engineering, Public Works, Fire, Police,
Schedule: Continuous

Policy 7: Where practicable, the City shall encourage the development of critical facilities within private residential communities, including congregate care and similar facilities, in order to ensure preparedness and maximum safety during periods of disaster which may limit accessibility and resources.

Program 7.A: Coordinate with management within local private and gated communities to train and educate residents, and develop, maintain and implement emergency preparedness plans, including stockpile essential supplies, in accordance with the Citizens Emergency Response Teams (CERT) program, to ensure their self-sufficiency for a period of at least 72 hours following an emergency or disaster.
Responsible Agency: Fire, gated communities.
Schedule: 2019, Continuous

Program 7.B Develop and maintain a record-keeping system indicating which private and gated communities have participated in the CERT training, and communicate with those communities on an annual basis to schedule training updates and coordinated response planning.
Responsible Agency: Fire, private/gated communities.
Schedule: 2020-22, Annually

Policy 8: The City shall make every effort to minimize the risk of hazards associated with aircraft operations of the Palm Springs International Airport and through the adoption and implementation of land use plans and policies consistent with the County Airport Land Use Compatibility Plan.

Policy 9: Continue to encourage residents, business-owners and others in the community to sign up for the automated emergency *Cathedral City Notification System* to get critical information quickly in the event of severe weather alerts, unexpected road closures, missing person alerts, and evacuations of buildings or neighborhoods.

Policy 10: The City shall review its emergency preparedness plans and ensure that it includes programs that address the need for social and emotional support following an emergency or major disaster.

Policy 11: The City shall coordinate with the Palm Springs School District, City Senior Center, Library and the Salvation Army, and other organizations that can serve as emergency shelters for displaced residents in the event of a major disaster.

Policy 12: The City shall require all new development in areas within or adjacent to a very high fire hazard severity zone to use retardant landscaping, non-flammable roofing materials and other construction materials and techniques that reduce their fire hazard.

> **Program 12.A:** The City shall provide information on and encourage residents to plant and maintain drought-resistant, fire-retardant landscape species to reduce the risk of brush fire and soil erosion in areas adjacent to canyons; and to develop stringent site design and maintenance standards for areas with high fire hazard or soil erosion potential.
> **Responsible Agency**: Fire, Planning
> **Schedule**: 2020-22, Annually

Policy 13: Pursuant to Gov. Code 66474.02, prior to approval of subdivision maps in State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones (VHFHSZ), the City shall condition the map to meet SRA Fire Safe Regulations and other fire hazard reduction regulations, particularly those regulations that ensure adequate and maintainable roadways for ingress, egress, and fire and other emergency equipment access.

Policy 14: The City shall make every effort to direct development away from State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones (VHFHSZ), and minimize the extension of services and facilities that induce development in these areas.

Policy 15: Every effort shall be made to avoid the location of essential public facilities outside State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones (VHFHSZ) without comprehensive mitigation that precludes or minimizes the threat to these facilities.

Policy 16: As resources are available, the Planning Department shall incrementally develop a database that identifies properties that are not in conformance with the City's building and fire codes in terms of roads standards and vegetative hazard, and make an ongoing effort to bring such properties or structures into conformance.

Policy 17: New development and major rebuilding within a State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zone (VHFHSZ) shall be constructed according to current building standards and fire safe design in accordance with the California Building and Fire Codes, including but not limited to Gov. Code Section 51175-51189 and Public Resources Code 4290.

Policy 18: Approval of development proposed within a State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zone (VHFHSZ) shall require site-specific fire management plans that address fuel modification or incorporate open space and other defensible space areas, as well as multiple points of ingress and egress.

Policy 19: Approval of development proposed or to be rebuilt in a State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones (VHFHSZ) shall be contingent upon a City-approved roadside fuel reduction plan, and otherwise provide for the long-term maintenance of defensible space clearances around structures, subdivisions and other development, and include fire breaks in the VHFHSZ where appropriate.

Policy 20: The City Fire Department shall periodically survey, monitor and plan to address conditions within the City's State Responsibility Areas (SRAs) or Very High Fire Hazard Severity Zones (VHFHSZ) zones to identify and plan for the evacuation of at-risk occupants or residents and meet their special needs.

Policy 21: The City Fire Department Strategic Plan shall be periodically reviewed and updated as appropriate to ensure that its goals, standards and training programs and regimes are current with state requirements and the needs of the department and the community.

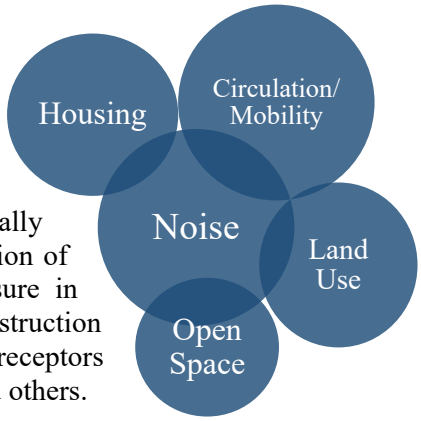
Noise Sub-Element

PURPOSE

The purpose of the Noise Sub-Element is to limit the exposure of sensitive lands, residents, students and visitors to excessive noise levels and that noise-sensitive land uses are protected at all times but especially during the most sensitive times of day. It is also meant to coordinate the community's land uses with the existing and future noise environment, and to design measures that minimize or avoid community exposure to excessive noise levels. As the City grows, so does the potential for land use conflicts which can result in an unacceptable and even harmful noise environment. This sub-element addresses potential adverse noise impacts associated with vehicular traffic, railroads and airports, industrial operations and other mobile or stationary noise sources. Through the implementation of the policies and programs in this sub-element, current and future noise impacts can be greatly reduced or avoided entirely.

BACKGROUND

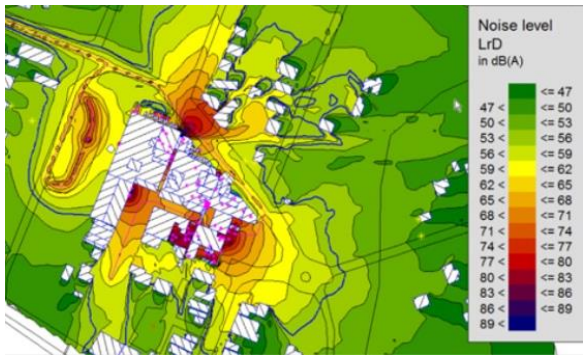
The Noise Sub-Element is directly related to the Land Use, Housing, and Circulation/Mobility Elements. It also has a direct relationship with the Parks and Recreation and the Economic and Fiscal Health Elements, low noise levels being a fundamental characteristic of a quality residential and resort community. The City's relatively quiet, peaceful atmosphere should be considered a major community asset. The noise environment can have a significant influence on the health and comfort of the community. In general, the noise levels in Cathedral City's residential neighborhoods are average, typical of quiet suburban and rural areas.



Motor vehicles are the major source of continuous, excessive noise in the City. Primary noise generators include traffic on Interstate-10, East Palm Canyon Drive, Date Palm Drive, Vista Chino, Palm Drive, Da Vall Drive, and Ramon Road. Freight rail traffic along the Union Pacific Railroad is also responsible for generating excessive noise and ground vibration. High noise levels resulting from aircraft operations at the Palm Springs International Airport also occasionally have an intrusive impact on the community's noise environment. The extension of airport runways to the northwest have reduced future airport noise exposure in Cathedral City to acceptable levels. Other noise generators include construction activities, industrial operations, HVAC and other stationary sources. Sensitive receptors within the planning area include homes, schools, congregate care facilities, and others.

Noise Regulations

Issues addressed in the Noise Sub-Element are identified in Government Code Section 65032(f), which requires that the Noise Sub-Element identify, quantify where possible and evaluate the community's noise environment and issue areas. Section 21083.1 of the California Environmental Quality Act (CEQA) requires the adherence to the State Guidelines and allows cities to determine whether a development project will have a "significant effect on the environment," ranging from traffic noise in a residential neighborhood to unacceptable noise generated by the equipment at a commercial shopping center or industrial operation. The State requires the adoption of a noise control ordinance for the resolution of local noise complaints.



Airport noise is also an important consideration for the City with the Palm Springs International Airport (PSP) located immediately west of the city limits. Local airports and associated noise generation, including PSP, are regulated by the Federal Aviation Administration and noise requirements established under Title 21, Section 5000 et seq of the California Code of Regulations. New or expanded school sites within two nautical miles of an airport runway, including Agua Caliente Elementary School, are subject to review by Caltrans Division of Aeronautics pursuant to Code of regulations Title 21, Section 3570 and State Education Code Section 17215. The primary purpose of state school regulation is to address compatibility issues associated with schools located within an airport's existing or projected future 65 dB CNEL contour (also see Community Noise Equivalent Level or CNEL below). None of the City's schools are located within an existing or future 65 CNEL noise contour generated by PSP.

The California Department of Health Services has prepared a Model Community Noise Control Ordinance as a model for use by local jurisdictions. The City of Cathedral City has such an ordinance in place (Chapter 11.96 of the City Municipal Code).

Ranges and Consequences of Noise

Noise sources are classified as either "line source" (a busy street) or "point source" (a commercial compressor). A number of factors affect the noise as it travels through the air, including temperature, wind speed and direction, hard and soft ground surfaces, and landscaping and walls. This is particularly important when considering the noise generated by a roadway, insofar as these factors can mitigate or intensify the noise level.

Noise is measured in decibels (dB) and is a ratio that quantifies sound pressure. Normal conversation is roughly 55 dBA at five feet of separation, whereas a loud engine noise is about 100 dBA. Most everyday sounds occur in the range of 40 to 100 dBA. Doubling the sound energy of a noise source only increases the decibel rating by 3 dBA, due to the logarithmic nature of the sound measuring (decibel) scale; however, because of the internal mechanism of the human ear and how it receives and processes noise, a sound must be nearly 10 dBA higher than another sound to be considered twice as loud. High noise levels can affect everything from property values and economic productivity to psychological health.

When there is an increase in the difference between background or ambient noise and the noise generated from a particularly intrusive source such as, traffic, a barking dog, aircraft or industrial operations, adverse reactions to noise generally intensify. Noise control measures should reduce noise by 5 to 10 dBA in most circumstances to effectively lower the perceived sound. Therefore, loud and short duration noises from barking dogs and low-flying aircraft, for example, generally have little impact on community noise levels because of the averaging used in this measuring technique.

Community Noise Equivalent Level

The definition of "noise" is unwanted or undesired sound. Sound becomes unwanted noise when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. The combination of noise from all sources near and far is known as the Ambient Noise Level. A very sudden change in air pressure from the immediate "normal" atmospheric pressure results in airborne sound. For purposes of this discussion, the ambient noise level at a given location is termed "environmental noise".

In order to understand environmental noise, some familiarity with the physical description of noise is necessary. Frequency range, intensity/loudness and temporal/time-varying aspects are the primary physical characteristics of sound. The decibel (dB), A-weighted level (dBA), and Community Noise Equivalency Level (CNEL) are all used to describe and numerically weight noise. Each of these measurement scales are briefly described below.

As noted, the decibel is the unit of measurement describing the amplitude, or strength of sound. The A-weighted decibel approximates the subjective response of the ear to a noise source by discriminating against the very low and very high frequencies in the spectrum. The Community Noise Equivalent Level (CNEL) is the average of the intensity of a sound over a 24-hour period, with corrections for time of day. The time of day corrections includes the addition of five decibels to sound levels in the evening from 7 p.m. to 10 p.m., and the addition of 10 decibels to sound levels at night between 10 p.m. and 7 a.m. It is necessary to make these adjustments because of the decrease in background noise levels during the evening and night hours when compared to daytime hours. People are therefore more sensitive to noise during these times, and sounds are weighted accordingly. During evening and night hours, tolerable noise levels should be 5 to 10 dBA lower, and the CNEL number is weighted accordingly.

Table S-4
Typical Noise Level

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

Traffic Noise Analysis

As part of the 2040 General Plan update an exterior noise impact analysis was completed to determine the existing and future transportation-related noise levels and to identify potential necessary mitigation measures for future uses within the Plan update. The analysis indicates the primary source of noise impacts will be traffic-related noise from US I-10, other City roadways, and rail-related noise from Union Pacific Railroad (UPRR) lines. These are collectively referred to as “transportation corridors”.

Traffic generated by buildout of the 2040 General Plan will influence the traffic noise levels at land uses adjacent to study area roadways throughout Cathedral City. To quantify the traffic noise level increases at adjacent land uses, the changes in traffic noise levels on 39 roadway segments in the study area were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the General Plan *Transportation Analysis* (see Appendix E of the General Plan EIR).

To assess the off-site noise level impacts associated with the 2040 General Plan buildout, noise contour boundaries were developed for existing conditions (2017/2018) and General Plan Buildout (2040) traffic conditions. A comparison of the 2009 General Plan Buildout to the 2040 General Plan Buildout shows that the buildout traffic noise level increases will be less than significant in 2040.

Exterior Noise Levels

The results of the future transportation noise analysis show that the future noise-sensitive uses may experience future unmitigated exterior noise levels greater than the *normally acceptable* exterior noise level compatibility criteria identified in this sub-element. Based on the results of this analysis and the proximity of future noise-sensitive land uses to transportation corridors, the on-site transportation-related noise impacts at future noise-sensitive uses are expected to potentially exceed the General Plan land use compatibility guidelines, and therefore, impacts are *potentially significant*, and will require noise mitigation.

With noise management policies and programs set forth in this sub-element and noise mitigation measures in the General Plan EIR, the on-site transportation noise levels at future developments within the City can be reduced to a range from *normally acceptable to normally unacceptable* levels. If future developments are properly conditioned, interior noise levels satisfying the 45 dBA CNEL interior noise level standard for noise-sensitive uses can be achieved. Therefore, on-site traffic noise impacts can be considered *less than significant* with mitigation for future development as a part of the 2040 General Plan update.

Interior Noise Levels

With typical building construction and a windows-closed condition, a minimum 25 dBA CNEL reduction is achievable for new dwelling units and in other noise-sensitive uses. However, since the exterior noise levels from City transportation corridors have the potential to exceed 70 dBA CNEL, in some cases the minimum 25 dBA CNEL with standard building construction may still result in interior noise levels greater than 45 dBA CNEL. In some instances, detailed interior noise analysis based on site-specific architectural floor plans and elevations will be required to satisfy General Plan standards and the California Building Code for residential dwelling units. Therefore, since future interior noise levels of residential dwelling units may exceed 45 dBA CNEL, the noise level impact will be *potentially significant*, requiring interior noise mitigation. However, with the detailed interior noise analysis and the policies and programs set forth in this sub-element and the mitigation measure in the General Plan EIR, on-site transportation noise impacts on interior noise levels will be *less than significant*.

Long-Term Traffic Noise

Vehicular traffic, including automobiles, trucks, buses, and motorcycles, is the major noise source measured within the City. Cars generate noise from engine vibration, the interaction of tires and the roadway, and the exhaust system. Noise produced by traffic fluctuates in relation to its volume, the percentage of trucks, and the average speed. Compared to buildout of the previous General Plan, the 2040 General Plan buildout conditions will generate traffic noise level changes ranging from decreases of 0.7 to increases of 0.6 dBA CNEL on the study area roadways. These decreases and increases are based on the Year 2040 ADT volumes form the *Transportation Analysis*, which vary by roadway segment based on the changes in conditions from 2040 General Plan conditions. The increases in noise levels represent a *less than significant* impact. Table S-5 presents the 2040 General Plan Buildout roadway noise levels measured from roadway centerlines and are calculated to range from 67.9 to 77.4 dBA CNEL. Exhibit S-8 graphically illustrates future roadway and railroad noise contours

Interstate-10 and Southern Pacific Railroad Lines

In addition to traffic along East Palm Canyon Drive/Highway 111 and the other major arterial roadways, both incorporated and sphere areas are impacted by rail and vehicular traffic associated with the Southern Pacific Railroad line and U.S. Interstate-10, respectively. The passage of trains, although an intrusive noise event, occurs only periodically and with limited duration. The substantial groundborne vibrations generated by rail traffic are further discussed below (see Rail Vibration Analysis).

More significant is the influence of Interstate-10 traffic noise, which increases at night due to persistent truck volumes combined with an atmospheric nighttime temperature inversion. This inversion tends to reduce the acoustic attenuation typical of distance over open terrain, making noises seem louder. Railroad traffic currently (2018) is an average of 40 trains per day, with an assumed speed of 70 mph, an average of 80 cars per train and a train length of 5,200 feet. By 2040, traffic on the UPRR lines could reach 70± trains per day.

Table S-5
Roadway Noise Levels in 2040

Road	Segment	Adjacent Land Use[1]	dBA CNEL			
			@ Adj. Land Use	70	65	60
				CL to Contour Distance (Feet)[2]		
Palm Dr.	n/o I-10 WB Ramps	Mixed-Use (Urban)	75.2	140	302	652
Gene Autry Tr.	s/o I-10 EB Ramps	Vacant	75.1	139	299	644
Mountain View Rd.	n/o Varner Rd.	Open Space (Public)	76.3	152	327	704
Landau Bl.	n/o Ramon Rd.	Residential	74.2	97	210	452
Cathedral Cyn Dr.	n/o Dinah Shore Dr.	Residential	72.2	62	133	287
Cathedral Cyn Dr.	s/o Dinah Shore Dr.	Business Park/Residential	72.5	64	139	299
Date Palm Dr.	s/o Varner Rd.	Mixed-Use (Urban)	73.6	109	235	506
Date Palm Dr.	s/o I-10 EB Ramps	Commercial	75.5	147	316	681
Date Palm Dr.	n/o 30th Av.	Mixed-Use/Business Park	74.1	118	253	546
Date Palm Dr.	n/o Ramon Rd.	Commercial/Residential	73.8	112	241	520
Date Palm Dr.	n/o Dinah Shore Dr.	Commercial/Residential	72.9	98	212	457
Date Palm Dr.	n/o Gerald Ford Dr.	Commercial	72.1	87	188	404
Date Palm Dr.	n/o Hwy. 111	Commercial	71.6	80	173	374
Da Vall Dr.	n/o Ramon Rd.	Public/Residential	72.7	84	181	391
Da Vall Dr.	s/o Ramon Rd.	Commercial/Residential	72.4	81	174	375
Bob Hope Dr.	n/o I-10 WB Ramps	Mixed-Use (Urban)	77.4	198	426	917
Bob Hope Dr.	s/o I-10 EB Ramps	Mixed-Use (Urban)	75.7	151	326	703
Varner Rd.	e/o Palm Dr.	Mixed-Use (Urban)	67.9	RW	79	171
Varner Rd.	w/o Date Palm Dr.	Open Space (Public)	76.5	158	339	731
Varner Rd.	e/o Date Palm Dr.	Mixed-Use (Neighborhood)	74.5	101	219	471
Valley Center Bl.	e/o Palm Dr.	Mixed-Use (Urban)	72.5	82	176	379
Valley Center Bl.	e/o Date Palm Dr.	Mixed-Use (Urban)	70.3	58	125	270
Valley Center Bl.	e/o Da Vall Dr.	Open Space (Public)	68.4	RW	95	205
Vista Chino	w/o Landau Bl.	Commercial/Residential	74.2	110	237	510
Vista Chino	w/o Date Palm Dr.	Commercial/Residential	73.7	103	221	476
30th Av.	w/o Date Palm Dr.	Commercial/Residential	68.9	RW	81	174
30th Av.	e/o Date Palm Dr.	Mixed-Use (N)/Residential	70.6	48	103	223
Ramon Rd.	w/o Landau Bl.	Open Space (Water)	74.8	120	259	558
Ramon Rd.	e/o Landau Bl.	Commercial/Residential	73.5	100	215	464
Ramon Rd.	w/o Da Vall Dr.	Commercial/Residential	73.4	97	210	452
Dinah Shore Dr.	w/o Cathedral Cyn. Dr.	Business Park/Residential	72.9	81	175	377
Dinah Shore Dr.	e/o Date Palm Dr.	Business Park/Residential	74.2	99	213	460
Gerald Ford Dr.	e/o Date Palm Dr.	Open Space (P)/Residential	72.6	80	173	373
Perez Rd.	w/o Cathedral Cyn. Dr.	Industrial	69.8	RW	113	244
Perez Rd.	e/o Cathedral Cyn. Dr.	Industrial	70.2	56	120	258
Hwy. 111	w/o Canyon Plaza Dr. W.	Commercial/Public	75.4	145	311	671
Hwy. 111	w/o Cathedral Cyn. Dr.	Commercial	73.1	101	217	468
Hwy. 111	w/o Date Palm Dr.	Commercial	73.2	103	223	480
Hwy. 111	e/o Sungate Wy.	Commercial	74.2	120	258	555

1 Source: Proposed General Plan Land Use Map.
2 "RW" = Location of the respective noise contour falls within the right-of-way of the road.

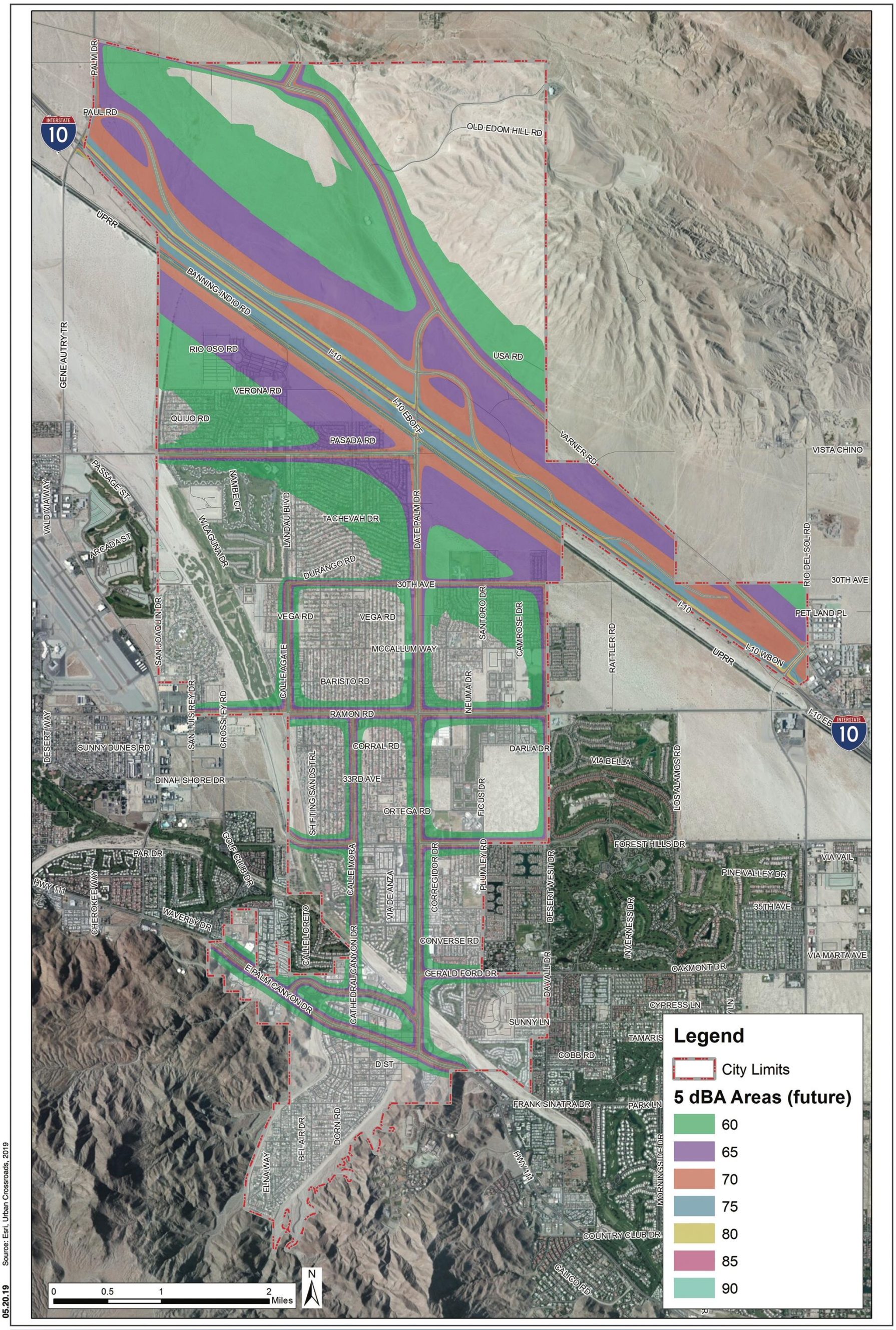


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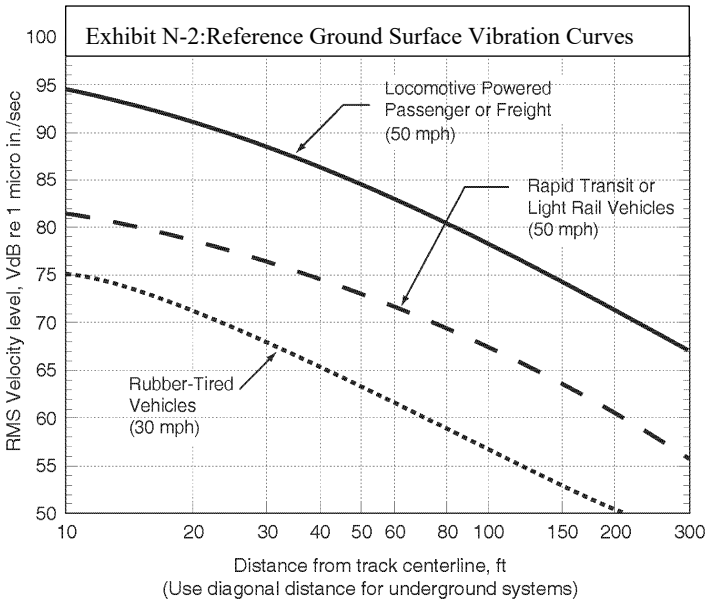
Exhibit S-8- 2040 Roadway and Railroad Noise Contours
Cathedral City 2040 General Plan

Cathedral City

Rail Vibration Analysis

The effects of groundborne vibration generated by rail traffic on the UPRR lines were analysed based on the methodology provided by the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment*. As with sound pressure waves that comprise "noise", rolling and impact vibrations from railroad engines and cars generate a pressure wave in the ground at different speed and intensities depending on the type of rock and soils they move through. Like sound pressure waves traveling through air, ground vibrations are measured in decibels and are noted as Vdb.



Rail activities are projected to generate vibration levels of up to 84 VdB at 50 feet from trains traveling at 50 mph. At the typical speed of 70 mph of rail activities on rail lines passing through the City, the reference vibration level is increased by 2.9 VdB, and results in estimated vibration impacts of 86.9 VdB at 50 feet from the railroad tracks.

The analysis shows that noise-sensitive and non-noise-sensitive uses within the City could be located within 50 to 150 feet of the UPRR railroad tracks and, therefore, may experience vibration levels which would exceed the noise-sensitive 72 VdB and non-noise-sensitive 75 VdB criteria for frequent rail events identified by the FTA. Policies and programs set forth in this sub-element and mitigation measures in the EIR are designed to reduce or otherwise mitigate these potential impacts to *less than significant* levels.

Aircraft Noise

Aircraft noises impacting the community come from commercial and general aviation operations at the Palm Springs International Airport (PSP), located west of the City Limits. The most current Airport Master Plan and Part 150 Noise Compatibility Study evaluated airport operations, monitored portions of the noise environment, and projected future noise impacts from planned expansions and increased operations. The flight tracks, or patterns, that aircraft are assumed to follow in the abovementioned noise study indicate limited overflights in Cathedral City, although in fact aircraft overflights are common. Although limited, military jets also land and take off from PSP.

As noted above, PSP noise is an important consideration for the City. New or expanded school sites within two nautical miles of an airport runway, including Agua Caliente Elementary School, are subject to review by Caltrans Division of Aeronautics. The primary purpose of state school regulation is to address compatibility issues associated with schools located within an airport's existing or projected future 65 dB CNEL contour (also see Community Noise Equivalent Level or CNEL above). None of the City's schools are located within an existing or future 65 CNEL noise contour generated by PSP.

Section PS.2, Additional Compatibility Policies, of the Palm Springs International Airport Land Use Compatibility Plan (2005), states:

> *2.1 Noise Exposure in Residential Areas: The limit of 60 dB CNEL set by Countywide Policy 4.1.4 as the maximum noise exposure considered normally acceptable for new residential land uses shall not be applied to the environs of Palm Springs International Airport. For this airport, the criterion shall instead be 62 dB CNEL. This higher threshold takes into account the ambient noise conditions in the area and also the community's long-standing exposure to the noise of airline aircraft operations. Dwellings may require incorporation of special noise level reduction measures into their design to ensure that the interior noise limit of 45 dB CNEL (Countywide Policy 4.1.6) is not exceeded.*

The California Airport Land Use Planning Handbook issued by the State of California Department of Transportation, Division of Aeronautics states that the maximum noise exposure criteria for which residential development is considered normally acceptable should be consistent between the General Plan noise element and ALUCP criteria. However, it also states that "a general plan may establish a different limit with respect to aviation-related noise than for noise from other sources (this may be appropriate in that aviation-related noise is sometimes judged to be more objectionable than other types of especially loud noises)." The standard for maximum outdoor noise levels in residential areas in Cathedral City is 65 dB CNEL, and the level established for Palm Springs International Airport is 62 dB CNEL. As noted above, it is permissible for the general plan noise limit and ALUCP noise limit to be different and, therefore, there are no conflicts with the ALUC.

Based on applicable PSP land use policies, "*dwellings may require incorporation of special noise level reduction measures into their design to ensure that* (compliance with) *the interior noise limit of 45 dB CNEL"*. These features would be incorporated into new residential construction as part of the building permit process, and based on the exterior noise levels approaching and around 60 dBA CNEL, are anticipated to reduce aircraft flyover noise to below the 45 dBA CNEL interior noise level standard for residential uses with standard building construction. Given the location of the 2025 60 dbA CNEL PSP noise contour, little or no specific mitigation would be required to ensure that new residential development satisfies the 45 dBA CNEL interior noise level standard. Therefore, while noise from aircraft operations will likely be heard, they will not significantly impact noise-sensitive uses in the City.

Exhibit S-9 - Palm Springs International Airport Noise Contours (2025)
Cathedral City 2040 General Plan

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Cathedral City

Mechanical and Industrial Noise

There are other noise generators within the City, in addition to noise generated by motor vehicles, rail traffic and aircraft that could create significant noise impacts. Activities such as construction and automotive repair and other related industrial operations can result in unacceptable noise levels. Loading areas, materials transfers and other acoustically unscreened operations will also raise issues of excessive noise and compatibility.

Significant noise can also result from the operation of mechanical equipment, including refrigeration units and heating/ventilation/air conditioning (HVAC) equipment in commercial and industrial centers. Noise from roof-mounted equipment can travel to bordering neighborhoods and impact sensitive receptors. Fans and compressors, as well as pool equipment, emit a constant hum that can be a significant annoyance and adversely affect the quality of life in a residential neighborhood. The thoughtful design and location of equipment can help mitigate this potential impact and should be included in the review of new development projects by the City.

Community Noise and Land Use Compatibility

The standard used for maximum outdoor noise levels in residential areas in California and in the City is a CNEL of 65 dBA. Within the City, the applicable limit one-hour average for outdoor noise levels in residential areas is 55 dBA (Ordinance 11.96.030; further discussed below). The noise impacts are “unmitigated” or represent the worst-case noise impact without any obstruction of the noise. A number of tools are available to the City to substantially reduce noise impacts, as discussed below.

Sensitive noise receptors include residences, schools, libraries, churches, hospitals and nursing homes, and destination resort areas. Golf courses, parks, and other outdoor activity areas can also be sensitive to noise levels. Less sensitive land uses include commercial and industrial centers, hotels and motels, neighborhood ballparks and other outdoor spectator sport facilities. The least sensitive uses are heavy commercial and industrial uses. Table S-6 depicts the CNEL ranges of allowable exterior ambient noise levels for various land uses at buildout.

Table S-6 Land Use Compatibility for Community Noise Environments

Land Uses	CNEL (dBA)						
	50	55	60	65	70	75	80
Residential - Single Family Dwellings, Duplex, Mobile Homes	A	B			C	D	
Residential – Multiple Family		A	B		C	D	
Transient Lodging: Hotels and Motels			A	B	C		D
School Classrooms, Libraries, Churches, Hospitals, Nursing Homes and Convalescent Hospitals			A	B	C		D
Auditoriums, Concert Halls, Amphitheaters			B			C	
Sports Arenas, Outdoor Spectator Sports			B			C	
Playgrounds, Neighborhood Parks			A		C	D	
Golf Courses, Riding Stables, Water Recreation, Cemeteries			A		C		D
Office Buildings, Business, Commercial and Professional			A		B	D	
Industrial, Manufacturing, Utilities, Agriculture			A		B	D	

Source: *California Department of Health Services, "Guidelines for the Preparation and Content of the Noise Element of the General Plan,"* 1990

A - Normally Acceptable: With no special noise reduction requirements assuming standard constructions.

B - Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design.

C - Normally Unacceptable: New construction is discouraged. If new construction does not proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

D - Clearly Unacceptable: New construction or development should generally not be undertaken.

Cathedral City Noise Ordinance

Chapter 11.96 of the City Municipal Code establishes community-wide noise standards and emphasizes the value of an acceptable noise environment. It provides regulations for noise measurement and monitoring and cites special provisions of, and exemptions to, the ordinance. It is intended to regulate excessive noise from existing uses and activities, and to serve as a reference guide for identifying other pertinent noise regulations. The City Noise Ordinance provides definitions of key terms and establishes exterior noise level standards on a time-of-day basis along with adjustments for intensity and duration. Violations of the Noise Ordinance are defined as a nuisance and subject to the procedures, remedies and penalties for such nuisances. The Noise Ordinance regulates existing uses and activities, while the noise standards in the General Plan are intended to guide the location of future noise generators and sensitive land uses.

Mitigating Noise Impacts

Preserving a quiet noise environment can be accomplished through thoughtful land use and transportation planning, project and building design and orientation, project-specific mitigation, simple and sophisticated technology, and acoustical barriers. Site planning and design standards should provide direct noise impact mitigation for areas particularly impacted by noise. The use of buffer zones consisting of earthen berms, walls and landscaping between sensitive land uses and roadways and other noise sources is an effective tool for noise mitigation. Building orientation, particularly the placement of windows, can significantly mitigate impacts on residential land uses. A number of materials are also available which can baffle noise sources, and result in effective outdoor and interior noise mitigation. When development proposals include sensitive receptors planned next to high-noise roadways (see Table S-5) they should be required to complete noise analysis, which will provide project-specific mitigation measures to ensure that the buildout of the project will not result in unacceptable noise impacts.

Section 2.12 of the General Plan EIR (and EIR Appendix D) sets forth specific mitigation measures for a variety of potential noise impacts. When applied where appropriate, they will effectively reduce noise impacts to levels that are less than significant. These include measures that address traffic and railroad noise and vibration, HVAC, commercial and industrial noise sources, construction and other noise sources. Areas of greatest concern include the UPRR/US I-10 corridor and arterial roadway corridors. While aircraft noise will be an occasional nuisance, on a CNEL-basis these impacts will be less than significant.

FUTURE DIRECTIONS

Consistent with its character as a resort residential community, Cathedral City benefits from an essentially quiet noise environment. However, highway and major roadway and railroad noise sources clearly impact the City. Future efforts to manage the community's noise environment should focus on the preservation of the peaceful and quiet atmosphere presently enjoyed by residents and visitors to the community. The Land Use Element, and particularly the assignment of land use designations, will play a critical role in the City's ability to control noise for sensitive receptors. Another level of land use control is provided by zoning designations and the City Noise Ordinance, which provide development standards that reduce impacts and enhance compatibility. The Circulation and Mobility Element has also been designed, where possible, to protect the City's residential areas from excessive traffic noise and to assure appropriate noise levels. The ongoing coordination of these two elements of the General Plan must play a key role in the City's consideration of development projects, and public works construction.

GOAL, POLICIES AND PROGRAMS

Goal 1: A community noise environment that complements the City's low density, resort residential character and its various land uses.

> **Policy 1:** Protect noise sensitive land uses, including residential neighborhoods, schools, hospitals and assisted living facilities, libraries, churches, resorts and community open space, from high noise levels generated along major transportation corridors.
>
> > **Program 1.A:** Develop and maintain an inventory of existing and future noise sources and areas of incompatibility and establish procedures, methods and standards to reduce the noise levels in these areas to acceptable levels.
> > **Responsible Agency:** Planning; Public Works
> > **Schedule**: Immediate; Ongoing
> >
> > **Program 1.B:** Prior to development plan approvals for new noise-sensitive development projects, require submittal of noise impact and mitigation analyses to the Planning Department identifying practicable noise mitigation measures ensuring compliance with City standards.
> > **Responsible Agency:** Planning, Public Works
> > **Schedule**: Immediate; Ongoing

Program 1.C: Prior to development plan approvals for new residential and similar noise sensitive projects, require submittal of noise impact and mitigation analyses to the Planning Department that demonstrates that the interior noise levels in all habitable rooms will satisfy the 45 dBA CNEL interior noise level standard of the General Plan and Title 24, Part 2, of the California Building Code
Responsible Agency: Planning, Public Works
Schedule: Immediate; Ongoing

Program 1.D: Prior to development plan approvals for new noise-sensitive development projects within 150 feet of UPRR railroad tracks, require submittal of a final vibration study, which identifies all practicable mitigation measures to satisfy the 72 VdB noise-sensitive and 75 VdB non-noise-sensitive vibration level standards, as defined by the FTA for frequent rail events.
Responsible Agency: Planning, Public Works
Schedule: Immediate; Ongoing

Program 1.E: Maintain, update and enforce the City's Noise Ordinance that establishes community-wide noise standards and identifies measures designed to resolve noise complaints.
Responsible Agency: Planning
Schedule: Immediate; Ongoing

Program 1.F: Require major stationary noise-generating sources throughout the City to install additional noise buffering or reduction mechanisms on development sites and/or within facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities.
Responsible Agency: Planning
Schedule: Immediate; Ongoing

Program 1.G: Parking lots, loading zones, and large trash bins shall be located the greatest distance practicable from adjacent residential properties, and designed is a manner that reduces associated noise impacts to levels allowable by the City's Noise Ordinance.
Responsible Agency: Planning Department
Schedule: Immediate; Continuous.

Policy 2: The relationship between land use designations in the Land Use Element and changes in the circulation pattern of the City, as well as individual developments, shall be monitored and mitigated.

Program 2.A: The City Zoning Ordinance and development review standards shall be used to limit land use patterns and project designs to those that are compatible with the existing and long-term noise environment.
Responsible Agency: Planning
Schedule: Immediate; Continuous

Program 2.B: Develop guidelines and minimal criteria requirements for noise analyses for future development projects and in compliance with the General Plan Noise Study. Studies shall evaluate project impacts and the effectiveness of proposed mitigation measures.
Responsible Agency: Planning, Public Works
Schedule: 2020; Every five years.

Program 2.C: Periodically review and amend the Land Use map as appropriate to assure reasonable land use/noise level compatibility.
Responsible Agency: Planning
Schedule: Annually.

Policy 3: Private sector project proposals shall include measures that assure that noise exposures levels comply with State of California noise insulation standards as defined in Title 25 (California Noise Insulation Standards).

Policy 4: Maintain a circulation map which ensures low levels of traffic within residential neighborhoods, and assigns truck routes to major roadways only.

Program 4.A: Designate primary truck routes and ensure that they are clearly marked throughout the community and properly identified on mobile apps and other web-based platforms. Except for traffic providing location-specific services and deliveries, construction and delivery trucks shall be limited to those truck routes identified in the Circulation and Mobility Element.
Responsible Agency: Planning**,** Public Works, Engineering
Schedule: 2021

Program 4.B: Development projects which result in through-traffic in residential neighborhoods shall be discouraged through the development review process, and most viable alternative routes shall be identified and adhered to.
Responsible Agency: Planning, Public Works, Engineering
Schedule: Ongoing

Policy 5: Maintain an ongoing contact with the Palm Springs Airport to ensure that flight paths and airport improvements and operations do not impact or extend noise contours into the City.

Policy 6: Coordinate with adjoining municipalities to ensure noise-compatible land uses across jurisdictional boundaries.

Policy 7: The City shall restrict grading and construction activities that may impact residential neighborhoods to specified days of the week and times of day as set forth in the City Noise Ordinance.

Policy 8: The City shall evaluate and condition all development and other construction projects that have the potential to impact sensitive nearby land uses.

Program 8.A: Where applicable, prior to the issuance of building permits for new development or other construction projects, when sensitive receiver locations are within 100 feet of proposed construction activities the City shall require the submittal of construction noise impact analysis and management plans that demonstrate:

- Exterior construction noise levels at the closest sensitive receiver locations will satisfy the FTA 80 dBA L_{eq} residential and 85 dBA L_{eq} commercial 8-hour construction noise level standards and the 0.01 in/sec RMS vibration standard for sensitive uses. The site-specific study shall identify the necessary noise and/or vibration mitigation measures, if any, required to reduce exterior noise and vibration levels to below FTA noise and City vibration thresholds; and
- Measures to reduce construction noise and vibration levels, such as those provided below, shall be incorporated in the final noise management plan, if necessary:
  - Install temporary construction noise barriers at the development site boundary which break the line of sight for occupied sensitive uses for the duration of construction activities. The noise control barrier(s) must provide a solid face from top to bottom and shall:
    - Provide a minimum transmission loss of 20 dBA and be constructed with an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts;

  - Properly maintained with any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired.

- Install sound dampening mats or blankets to the engine compartments of heavy mobile equipment (e.g. graders, dozers, heavy trucks). The dampening materials must be capable of a 5 dBA minimum noise reduction, must be installed prior to the use of heavy mobile construction equipment, and must remain installed for the duration of the equipment use.
- Construction activities requiring loaded trucks, large bulldozers, and jackhammers within 50 feet of nearby sensitive land uses (e.g. residential, school, etc.) shall be minimized, or alternative equipment or methods shall be used, unless the vibration levels are shown to be less than the City threshold of 0.01 in/sec RMS.

Responsible Agency: Planning, Public Works, Engineering
Schedule: Immediate; Ongoing