6. SAFETY ELEMENT

BACKGROUND AND CONTEXT

Protecting and preserving the health, safety, and welfare of the community is an issue of fundamental concern to the City. As such, it is important that the City of Palm Springs maintain and improve programs that effectively address safety and climate change considerations. The Safety Element discusses natural and human-caused hazards that might occur, evaluates how these hazards are projected to change in the future, and presents a comprehensive set of goals and policies to minimize the effects of these hazards. Actions to implement these goals and policy can be found in Appendix X. More detailed information regarding climate change hazards can be found in Appendix X of the Safety Element.

The Safety Element serves the following functions:

- Develops a framework by which safety considerations are introduced into the land use planning process.
- Facilitates the identification and mitigation of hazards for new development, thus strengthening existing codes, project review, and permitting processes.
- Presents policies and implementation programs, contained in Appendix X, directed at identifying and reducing hazards in existing development.
- Strengthens hazard preparedness planning and post-disaster reconstruction policies.
- Identifies how hazards are likely to increase in frequency and intensity due to climate change and provides policies to increase community resilience.

The Safety Element is divided into nine sections addressing required or supplementary issues identified in California Government Code Section 65302(g). Each section provides an overview of the issue as well as goals and policies to respond to the associated public safety issue. These sections are the following:

1. Disaster Preparedness, Response, and Recovery
2. Seismic Hazards
3. Geologic Hazards
4. Flooding and Dam Inundation
5. Fire Hazards
6. Hazardous Materials and Waste
7. Airport Safety
8. Public Safety
9. Additional Climate Change Hazards

REGULATORY FRAMEWORK

Under state law, all counties and incorporated communities in California must prepare a General Plan that addresses several topics, one of which is safety. The Safety Element addresses this topic in accordance with state requirements, which are primarily laid out in California Government Code Section 65302(g). State law requires that the Safety Element address the following:

- Protect the community from risks associated with a variety of hazards, including seismic activity, landslides, flooding, and wildfire, as required by the California Government Code Section 65302(g)(1).
- Map and assess the risk associated with flood hazards, develop policies to minimize the flood risk to new development and essential public facilities, and establish effective working relationships among agencies with flood protection responsibilities, as required by California Government Code Section 65302(g)(2).
- Map and assess the risk associated with wildfire hazards, develop policies to reduce the wildfire risk to new land uses and essential facilities, ensure there is adequate road and water infrastructure to respond to fire emergencies, and establish cooperative relationships between fire protection agencies, as required by California Government Code Section 65302(g)(3).

- Assess the risks associated with climate change on local assets, populations, and resources. Note existing and planned development in at-risk areas and identify agencies responsible for providing public health and safety and environmental protection. Develop goals, policies, objectives, and feasible implementation measures to reduce the risks associated with climate change hazards, including locating new public facilities outside of at-risk areas, providing adequate infrastructure in at-risk areas, and supporting natural infrastructure for climate adaptation, as required by California Government Code Section 65302(g)(4).
- Identify residential developments in any hazard area that do not have at least two emergency evacuation routes, as required by California Government Code Section 65302(g)(5).
- Identify new information relating to flood and fire hazards and climate adaptation and resiliency strategies applicable to the city or county that was not available during the previous revision of the safety element, during each revision of the housing element or local hazard mitigation plan, but not less than once every 8 years, as required by California Government Code Section 65302(g)(6).

RELATIONSHIP TO OTHER PLANS AND PROGRAMS

Federal, state, and local regulations and policies such as the California Environmental Quality Act (CEQA), the California Government Code, the Uniform Building Code, and the Palm Springs Municipal Code regulate and/or influence land use and development in Palm Springs. Not only do they help to protect the health, safety, and welfare of Palm Springs residents, visitors, and businesses by ensuring that proper analyses are conducted, sound construction practices are implemented, and uses are appropriately sited within the city, but they can also help to minimize the recovery time following a disaster.

Other General Plan Elements

The Safety Element is one of several elements of the Palm Springs General Plan. Other social, economic, political, and aesthetic factors must be considered and balanced with safety needs. Rather than compete with the policies of related elements, the Safety Element provides policy direction and designs safety improvements that complement the intent and policies of other General Plan elements. How land uses are determined in areas prone to natural hazards,

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what regulations limit development in these areas, and how hazards are reduced for existing development, are all among issues that tie the elements together. For instance, Land Use Element diagrams and policies must consider the potential for various hazards identified in the Safety Element and must be consistent with the policies to address those hazards. The Recreation, Open Space, and Conservation Element is also closely tied to the Safety Element. Floodplains, for example, are not only hazard areas, but often serve as sensitive habitat for threatened or endangered species or provide recreation or passive open space opportunities for residents and visitors. As such, flood and inundation policies balance the need to protect public health and safety with the need to protect habitat and open space. Safety Element policies, especially those concerning evacuation routes and critical facilities, must also be consistent with those of the Circulation Element. Interstate 10 is the primary evacuation route in the region, which is supported by major arterial routes such as State Route 111, Palm Canyon Drive, Ramon Road, and Sunrise Way shown in the City's Transportation and Circulation Element. Policies and information in this Safety Element should not conflict with those in other elements.

Palm Springs Local Hazard Mitigation Plan

Hazard Mitigation

Actions to reduce or eliminate loss of life and property damage by minimizing the impact of disasters.

Palm Spring's Local Hazard Mitigation Plan (LHMP) is a plan to identify and profile hazard conditions, analyze risk to people and facilities, and develop mitigation actions to reduce or eliminate hazard risks in in the city. The City prepared the LHMP in accordance with the federal Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency's (FEMA's) LHMP guidance, and FEMA has certified the City's most recent LHMP. The mitigation actions in the LHMP include both short-term and long-term strategies, and involve planning, policy changes, programs, projects, and other activities. The LHMP and Safety Element address similar issues, but the Safety Element provides a higher-level framework and set of policies, while the LHMP focuses on more specific mitigation actions, often short-term. The City's LHMP focuses on mitigation-related actions, while the Safety Element also includes policies related to emergency response and recovery activities. The current LHMP is incorporated into this Safety Element by reference, as permitted by California Government Code Section 65302.6.

Palm Springs Emergency Operations Plan

The Emergency Operations Plan (EOP) provides procedures for City staff that address readiness, mobilization, and contingency planning to allow for uninterrupted delivery of essential City functions during disasters. The EOP aims to saves lives, prevent property damage, protect and assist the public with emergencies, and facilitate recovery after a disaster. The City is prepared to maintain its core level of service during emergency situations, such as fire, earthquake, or other hazardous events through implementation of the EOP.

CLIMATE CHANGE VULNERABILITY

Climate change is expected to affect future occurrences of natural hazards in and around Palm Springs. Many of these hazards will likely become more frequent and intense in coming years and decades. In some cases, these trends have already begun, such as droughts, extreme heat, and wildfires. According to California's *Fourth Climate Change Assessment*,[1] Palm Springs can expect to experience various changes to climate change hazards.

- Both droughts and floods are expected to become more frequent because precipitation is expected to occur in fewer, more intense storms. Although Palm Springs is likely to experience only a slight increase in overall annual precipitation levels, the region is expected to see an increase in the number of extreme precipitation events. As a result, floods are expected more often in Palm Springs, and climate change may expand the parts of the city that are considered flood prone. Climate change is also expected to increase the frequency and severity of droughts, straining aquatic habitats and water supplies in the city.
- Warmer temperatures are projected to cause an increase in extreme heat events, which are days when the high temperature significantly exceeds normal levels. The number of extreme heat days is expected to rise in Palm Springs, in addition to an increase in the average daily high temperatures. Extreme heat poses a significant human health risk, especially

[1] Bedsworth, Louise, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja. (California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. Statewide Summary Report. California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013.

to children, outdoor workers, seniors, persons experiencing homelessness, and undocumented persons. Some infrastructure and community services may be damaged by very high temperatures, constraining their ability to meet community needs.

- Climate change can increase the rates of infection for various diseases because many of the animals that carry diseases are more active during warmer weather. There are several diseases that are linked to climate change and can be harmful to the health of Palm Springs community members, such as hantavirus pulmonary syndrome, Lyme disease, and West Nile virus. Many of these diseases are carried by animals, such as mice and rats, ticks, and mosquitos, which are usually seen as pests even if they do not cause infections. Warmer temperatures earlier in the spring and later in the winter can cause these animals to be active for longer periods, increasing the time that these diseases can be transmitted.
- Severe weather events, such as high winds, sandstorms, and heavy rainfall, may become more frequent and intense. Climate change is expected to cause an increase in intense rainfall, which can cause flash flooding. In Palm Springs, most severe weather is linked to high winds. These winds can also pick up dust and other particulate matter from the desert or dry lakebed of the Salton Sea, causing sandstorms that lower visibility and cause toxic particulate matter to get into buildings and cause respiratory illnesses. The types of dangers posed by severe weather vary widely and include injuries or deaths, damage to buildings and structures, and roads blocked by debris or sand.
- Wildfires can be sparked by lightning, malfunctioning equipment, vehicle crashes, and many other causes. Warmer temperatures, an increase in drought conditions, and extreme wind events are likely to create more fuel for fires in natural and rural areas, leading to a greater chance that a spark will grow into a dangerous blaze. Climate change is also expected to extend the fire season throughout much (or even all) of the year. Because wildfires burn the trees and other vegetation that help stabilize a hillside and absorb water, more area burned by fire may also lead to an increase in landslides and debris flows.

Under California Government Code Section 65302(g)(4), the Safety Element is required to include a vulnerability assessment that looks at how people, buildings, infrastructure, and other key community assets may be affected by climate change. The City conducted a Climate Vulnerability Assessment in Spring 2022 to analyze Palm Springs' susceptibility to climate change hazards. The City of Palm Springs' vulnerability assessment, prepared in accordance with the most recent available guidance in the *California Adaptation Planning Guide*, assesses how eight different climate-related hazards (air quality, drought, extreme heat and warm nights, flooding, human health hazards, landslides, severe weather, and wildfire) may affect 66 different population groups and community assets. Each population or asset received a score of V1 (minimal vulnerability) to V5 (severe vulnerability) for each climate change hazard. The Vulnerability Assessment indicates that Palm Springs populations and assets are most vulnerable to flooding and wildfire. The Vulnerability Assessment Report provides an overview of the methods; summary of the climate change hazards, populations, and assets included in the assessment; and the full list of results, which can be found in Appendix X. The results of the Vulnerability Assessment are integrated into the hazard and other safety sections below.

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GOALS, POLICIES, AND ACTIONS

This section contains background information and policy direction related to hazards and safety provisions within the city. The hazard and safety items addressed in this element should be given careful consideration when new development, roads, parks, critical emergency facilities, infrastructure, or other projects are designed.

DISASTER PREPAREDNESS, RESPONSE, AND RECOVERY

The Palm Springs area is subject to significant natural and human-caused hazards that pose risks to life and property. Advance preparation for potential disasters can prevent losses of life and property, improving the City's ability to respond to and recover from emergency situations created by hazardous events. Due to the large number of public, quasi-public, and private agencies involved in disaster preparedness planning, cooperation and coordination between agencies are essential.

Depending on the type of incident, several different agencies and disciplines may be called in to assist with emergency response, including emergency medical, health, fire and rescue, police, and public works. The challenge is to accomplish the work at hand in the most effective manner, maintaining open lines of communication between the different responding agencies to share and disseminate information, and to coordinate efforts. This is primarily accomplished through implementation of the Emergency Operations Plan during a disaster. Once a disaster has occurred, the capability of the City to respond to the situation at hand affects how quickly it can recover from impacts.

The City of Palm Springs participates in the Standardized Emergency Management System (SEMS), which is required by the California Government Code and was developed to provide a "common language" for emergency response personnel to request resources and equipment from other agencies. In addition to resource allocation, SEMS was established to minimize the duplication of efforts during emergency response by defining common tactics and identifying a clear chain of command. The Standardized Emergency Management System adopted the California

Master Mutual-Aid Agreement, designed to ensure that adequate resources, facilities, and other support are provided to jurisdictions whenever their own resources are insufficient to cope with a given emergency. The City of Palm Springs participates in the California Master Mutual-Aid Agreement. The State Office of Emergency Services, Southern Region (Mutual Aid Region VI), serves the mutual-aid region that encompasses San Diego County, Imperial County, Riverside County, San Bernardino County, Inyo County, and Mono County. Automatic aid pacts with the Riverside County Emergency Management Department and local fire departments in nearby cities provide additional emergency management and response services in Palm Springs. Palm Springs Fire Department provides a variety of public safety services, including fire protection, medical aid, rescue, hazardous materials response, and educational safety programs such as Community Emergency Response Team training. Other services include emergency alerts, the Community Risk Reduction program, fire plan review and inspection, and wildfire preparedness.

The City of Palm Springs utilizes an Everbridge emergency alert mass notification system to notify the community of a disaster and distribute emergency information and instructions before, during, and after a disaster. This system alerts residents throughout the city about disasters, major emergencies, and other urgent information via text messages, email, phone, landline, and other means of communication.

The Palm Springs Emergency Management Department participates in the Federal Emergency Management Agency's (FEMA) Community Emergency Response Training (CERT) program, a series of classes that train residents to effectively respond in 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, provide basic medical aid and treatment for shock, search for and rescue victims safely, organize themselves and spontaneous 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 telephone information-retrieval system.

CERT trainees practice fire control.
(Source: City of Palm Springs Fire Department)

Essential, Sensitive, High-Occupancy Facilities

Essential facilities are infrastructure and buildings whose continued functioning is necessary to maintain public health and safety following a disaster. These include water, sewage, electrical power,

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Essential Facilities.

Facilities whose continued functioning is necessary to maintain public health and safety following a disaster, and facilities where damage or failure could pose hazards to life and property well beyond their immediate vicinity.

Sensitive Facilities.

Facilities used for manufacturing, storage, or sale of hazardous materials; socially significant facilities such as schools, nursing homes, housing for the elderly, and those with access and functional needs, or have mental health conditions.

High Occupancy Facilities.

Public or private structures for housing or assembly of large groups of people (i.e., libraries, auditoriums).

communication, transportation (highways, bridges, railroads, and airports), natural gas, and liquid fuel systems as well as police stations, fire stations, and emergency operation centers. These facilities are critical to the health and welfare of Palm Springs and are especially vital following hazard events. Essential facilities are particularly important for emergency response and recovery after a disaster that causes considerable citywide damage.

Sensitive facilities manufacture, store, or sell hazardous materials or are socially significant facilities such as schools, nursing homes, housing for the elderly, and those serving people with access and functional needs. These facilities should be designed to remain functional during and immediately after a disaster; however, they may provide limited services if the essential facilities they depend on are disrupted.

High-occupancy facilities house or support the assembly of large groups of people, such as conference centers, libraries, multifamily housing, or similar facilities. These facilities could serve as gathering spaces during a disaster and should be protected from hazardous events.

Because essential facilities deliver critical services to the community, it is important to consider the impacts to society from their disruption or failure in a disaster. The loss of essential infrastructure can have far-reaching, long-term effects on businesses, jobs, environmental quality, health, and people displaced from their homes. The severity of these effects often increases if services take a longer time to restore.

Evacuation

With advanced warning, evacuation can be effective in reducing injury and loss of life during a catastrophic event. Figure 6-1, *Evacuation-Constrained Residential Parcels,* shows the evacuation routes and evacuation-constrained residential parcels throughout the city. Primary emergency access and evacuation routes include I-10, Indian Canyon Drive, Highway 111, Palm Canyon Drive, Sunrise Way, Farrell Drive, Gene Autry Trail, Date Palm Drive, San Rafael Drive, Vista Chino, Tahquitz Canyon Way, Ramon Road, and Dinah Shore Drive. All evacuation routes in Palm Springs face a potential disruption from a flood, earthquake, or severe weather event, which may block roadways, damage the roadway surface, or collapse overpasses. In the event of widespread disruption to local evacuation

routes, remaining evacuation routes may become congested, slowing down evacuation of the community or specific neighborhoods. This issue may be compounded since evacuation routes for Palm Springs will also likely serve as evacuation routes for surrounding communities in the Coachella Valley, and so potential disruptions may have regional effects.

An analysis of the city's roadway network and parcels conducted as part of the Safety Element Update, as shown on Figure 6-1, shows that there are several evacuation-constrained residential parcels throughout the city. The evacuation-constrained parcels in western Palm Springs could be subject to wildfire and landslide hazards, and evacuation-constrained parcels in northern and southern areas of the city could be subject to flood hazards. All evacuation-constrained parcels are in at least one hazard-prone area and may have only one emergency evacuation route. The lack of multiple emergency access points limits roadway access for these properties, which may create difficulties if there is a need to evacuate.

GOAL SA1:

Minimized risk to life, property, and essential facilities from disasters through emergency preparedness, response, and recovery.

Policies

SA1.1 Locate new essential facilities outside of hazard prone areas, including Very High Fire Hazard Severity Zones, 100-year and 500-year floodplains, moderate to high landslide susceptibility areas, and Alquist-Priolo Fault Zones to ensure that they remain in operation during and after hazard events.

SA1.2 Collaborate with agencies and organizations that own and operate essential structures to ensure, to the fullest extent possible, that in the event of a major disaster, essential structures and facilities remain safe and functional, including but not limited to, retrofitting existing essential facilities to withstand hazardous events.

SA1.3 Incorporate the current Local Hazard Mitigation Plan, most recently adopted by FEMA in 2017, into this Safety Element by reference, as permitted by California Government Code

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Section 65302.6 to ensure that emergency response and evacuation routes are accessible throughout the city.

SA1.4 Coordinate disaster preparedness and recovery with other governmental agencies and continue to cooperate with surrounding cities, Riverside County, the State of California, and the various federal and tribal agencies to provide cooperative emergency preparedness and response in emergency situations.

SA1.5 Continue to participate in Master and Automatic Mutual Aid Agreements for long-term fire, police, medical response, public works, building inspection, mass care, and heavy rescue planning and response.

SA1.6 Continue to prepare the community to respond to emergencies by conducting public outreach programs such as CERT.

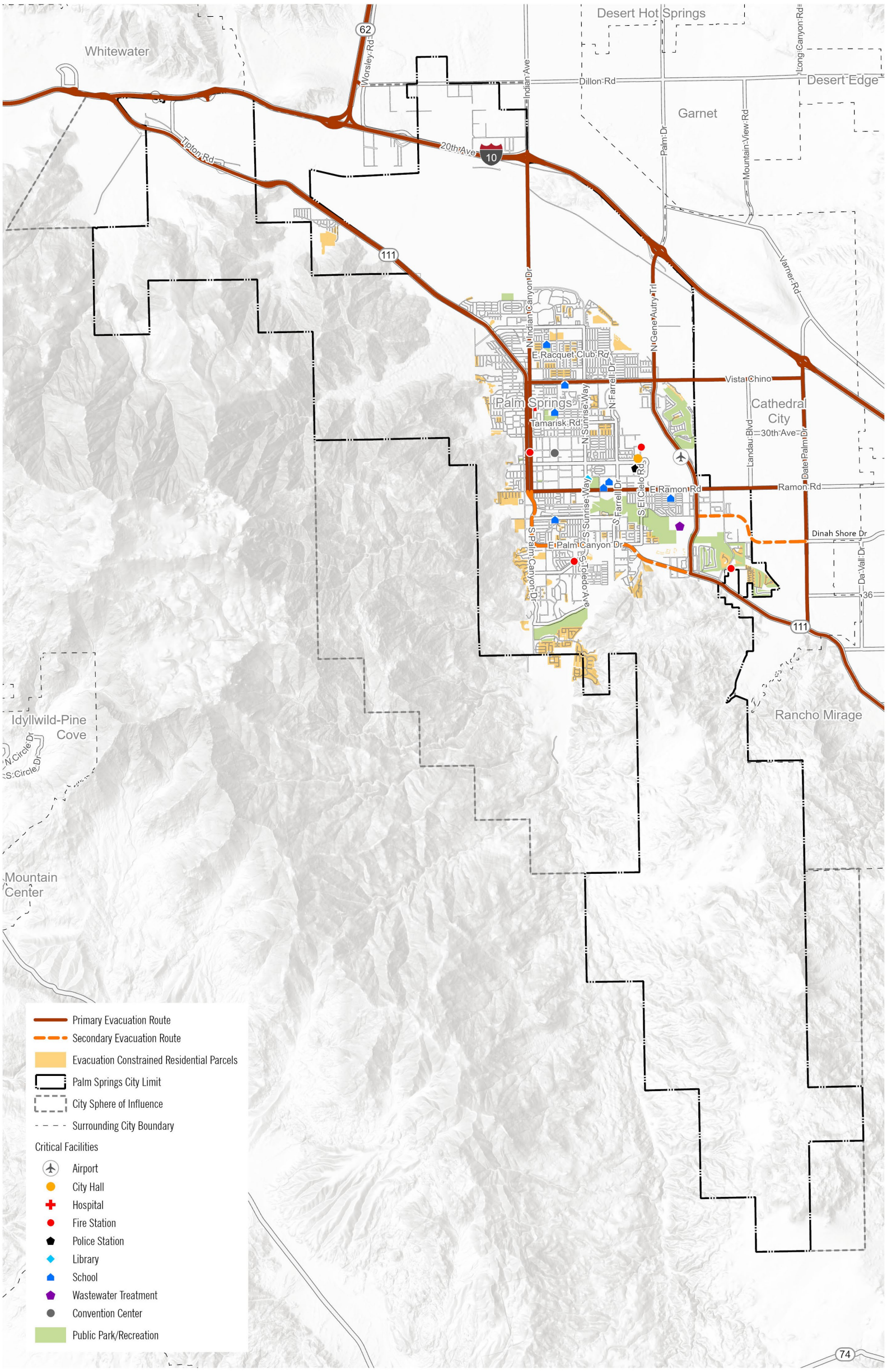
SA1.7 Enlist the cooperation of the business community to develop its own disaster response plans and have provisions for food, water, first aid, and shelter for employees who may not be able to return home for several days following a major disaster.

SA1.8 Formulate and maintain police, fire, evacuation, hospitalization, and recovery programs in response to all types of natural and human-caused hazards.

SA1.9 Plan for and facilitate the rapid and effective recovery of the city following a disaster, prevent the recurrence of specific problems and hazards encountered during a disaster, and plan for alternative sources of financing for reconstruction.

SA1.10 Ensure interoperability of cellular and radio networks before, during, and after a disaster for emergency responders.

Figure 6-1 Evacuation-Constrained Residential Parcels



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SA1.11 Include procedures for traffic control, emergency evacuations and housing, and security of damaged areas in all disaster response plans.

SA1.12 Evaluate new developments for their ability to provide proper police and fire protection and allow for effective evacuations. Project review should include, but is not limited to, adequacy of internal circulation systems and provision of project directories, street names, and numbering systems.

SA1.13 Ensure that new development does not result in a reduction of law enforcement or fire protection emergency response services below acceptable levels.

SA1.14 Require that all new buildings have at least two points of ingress/egress in project design.

SA1.15 Work with property owners to create at least two points of access for existing development within the Very High Fire Hazard Severity Zone or the Wildland-Urban Interface.

SA1.16 Ensure adequate dissemination of public emergency information to residents and businesses on actions to minimize damage and facilitate recovery from a natural disaster, in a variety of language and formats that are appropriate for the demographics of residents.

SA1.17 Integrate climate change hazards into emergency preparedness and response plans.

SA1.18 Establish a network of equitably located resilience centers throughout Palm Springs and ensure that resilience centers are situated outside of areas at risk from hazard impacts to the extent possible; offer refuge from extreme heat and poor air quality due to regional wildfire smoke or severe wind events; and are equipped with renewable energy generation and backup power supplies. Such facilities should be in easily accessible locations and be available to all community members, with set temperature, air quality, or other triggers for when they will be open.

SA1.19 Identify, assess, and reassess evacuation routes and develop a multi-hazard evacuation plan to ensure evacuation routes remain open and functional during

emergencies. Reassess the effectiveness of the evacuation routes with the update of the Palm Springs Local Hazard Mitigation Plan.

SA1.20 Ensure emergency evacuation routes are constructed and maintained to remain open during and after disasters.

SEISMIC HAZARDS

Seismic Shaking: Lateral movement, or acceleration, of the ground during an earthquake.

Surface Rupture: Occurs when movement on a fault deep within the earth breaks through to the surface. Although surface rupture typically results in a small percentage of the total damage in an earthquake, being too close to a rupturing fault can cause severe damage to structures.

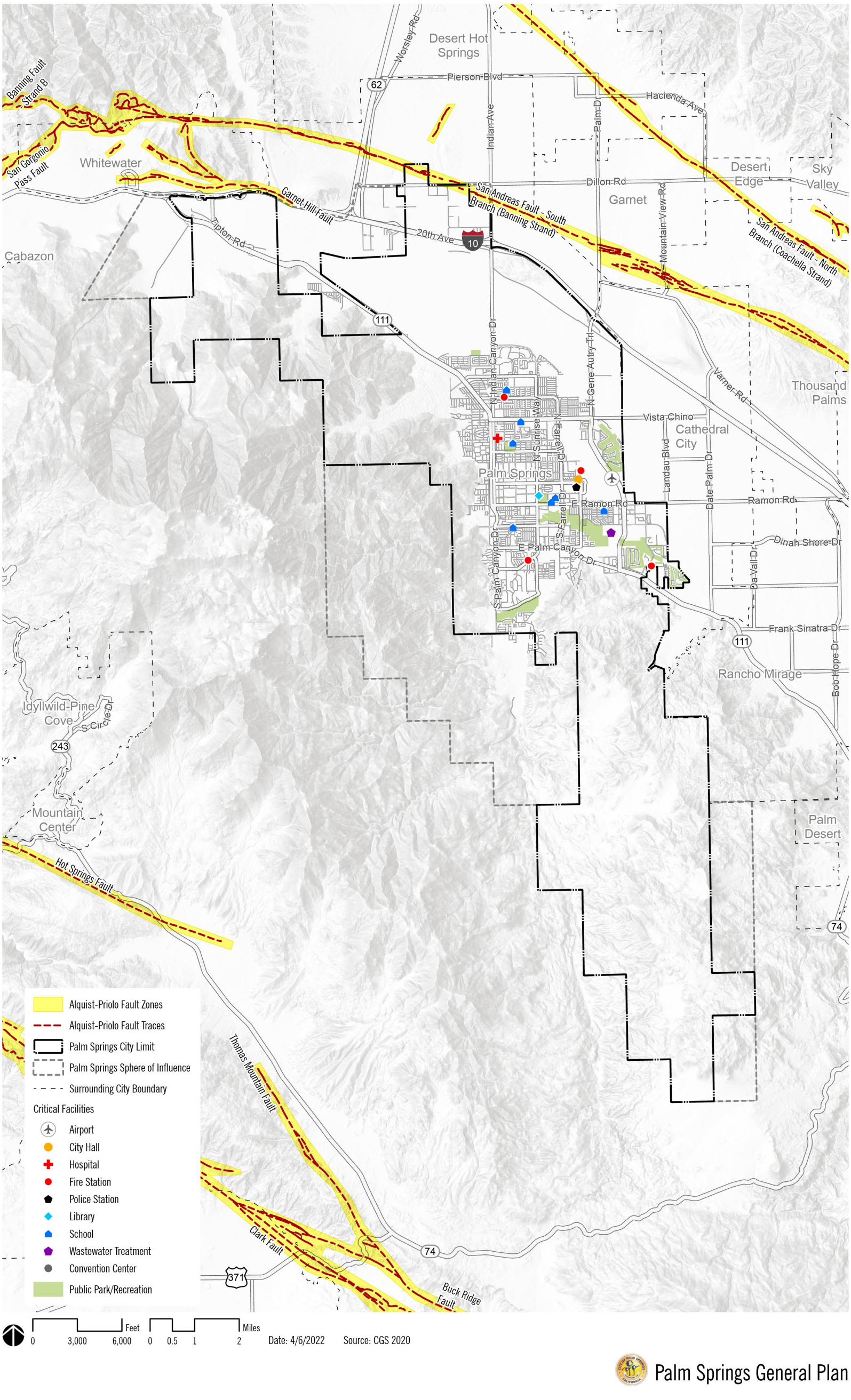
Surface Trace: Commonly referred to as a "fault line," it is the intersection of a fault plane with the surface of the earth.

The City of Palm Springs is in an area subject to substantial seismic hazards, such as earthquakes, liquefaction, and earthquake-induced slope failure and landslides. These seismic hazards can affect the structural integrity of buildings and utilities and, in turn, cause property damage and potential loss of life. Although it is not possible to prevent earthquakes, their destructive effects can be minimized through comprehensive hazard-mitigation programs and efforts.

Earthquakes and Fault Zones

The City of Palm Springs is in an area with numerous active faults. At least two active faults, the San Andreas and Garnet Hill Faults, depicted on Figure 6-2, *Regional Faults*, extend through the northern portions of the city. Both fault zones, along with other faults in the greater region, such as the San Gorgonio Pass and San Jacinto Faults, also have the potential to produce strong ***seismic shaking*** in Palm Springs.

Figure 6-2 Regional Faults



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The potential for ground rupture due to fault movement is commonly related to the seismic activity of known fault zones. Active faults are present along the northernmost reaches of the city, where the traces of the Garnet Hill and San Andreas Faults have been mapped. These faults have the potential to generate ***surface rupture*** or ground deformation in Palm Springs. As shown on Figure 6-2, Alquist-Priolo Fault Zones occur along the Garnet Hill Fault north of the city, the San Andreas Fault north and east of the city, and the Hot Springs and Thomas Mountain Faults southwest of the city. Under the Alquist-Priolo Earthquake Fault Zoning Act, the location of structures for human occupancy across the ***surface trace*** of an active fault is restricted. A Riverside County Fault Management Hazard Zone has been assigned to the portion of the Garnet Hill fault that extends to the north of the city. Riverside County has established Fault Management Hazard Zones in order to require subsurface investigations of the Garnet Hill Fault to determine, over time, if the traces of the fault are active. This designation for the Garnet Hill Fault allows Palm Springs to regulate future development across the trace of the fault.

Historically, major earthquakes affecting Palm Springs included the 1857 Fort Tejon earthquake with a magnitude (M_W) of 7.9; the 1992 Landers-Big Bear earthquakes of M_W 7.3; the 1986 North Palm Springs earthquake of a M_W of 6.0; the 1999 Hector Mine earthquake of M_W 7.1; and the 2019 Ridgecrest earthquake of M_W 7.1.

Laws to Mitigate Earthquake Hazards

The State of California regulates development in potentially seismically active areas through a variety of tools that reduce or mitigate potential hazards from earthquakes or other geological hazards.

The ***California Building Standards Code*** (BSC) contains provisions to safeguard against major structural failures or loss of life caused by earthquakes or other geologic hazards and identifies zones of seismic activity subject to varying degrees of potential impact and frequency of large earthquakes. The City of Palm Springs is potentially subject to the highest changes in speed or velocity due to seismic shaking.

Enacted in 1986, the ***Unreinforced Masonry Law*** required cities and counties to identify potentially hazardous unreinforced masonry (URM) buildings in their jurisdictions, establish a URM loss-reduction program, and notify the owners of such buildings of the potential earthquake hazard their buildings pose. Although this law sunset in

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2009, the California Building Code contains specific requirements to ensure the seismic safety of URM buildings.

The primary purpose of the ***Alquist-Priolo Earthquake Fault Zoning Act*** is to prohibit the location of structures for human occupancy across active surface traces of fault lines until geotechnical investigations determine that a potential building site is safe for habitation. The Act also requires cities to disclose to the general public, through the use of maps and other appropriate materials, areas that are subject to seismic hazards.

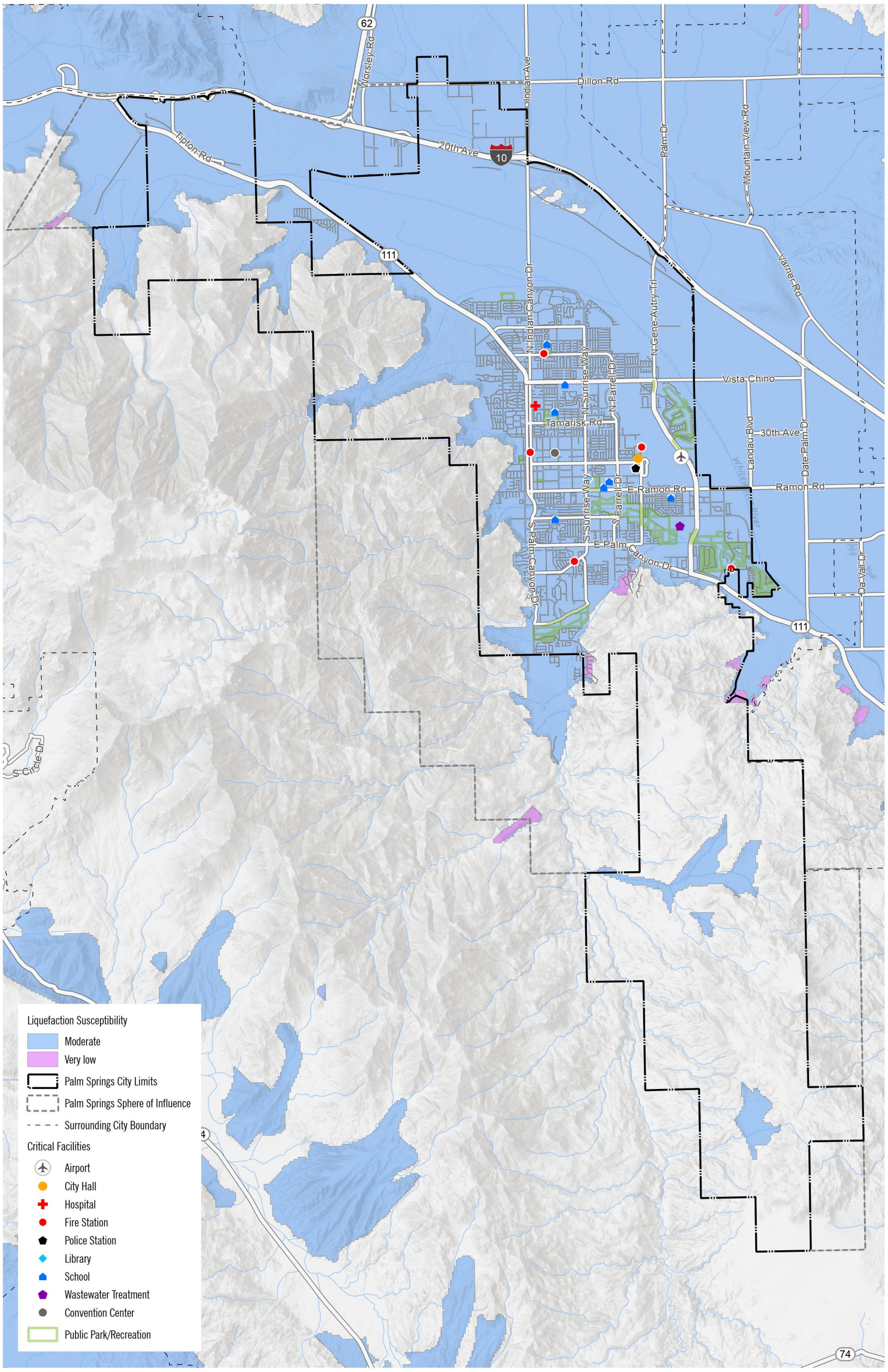
The ***Seismic Hazards Mapping Act*** (SHMA) of 1990 addresses nonsurface fault rupture earthquake hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The California Geological Survey (CGS) has not yet mapped the Palm Springs area under the SHMA. However, performing geological studies in those areas identified as having a liquefaction or slope-instability hazard would reduce the potential for damage from these hazards.

Liquefaction

Liquefaction occurs when loose, soft, unconsolidated, or sandy soils that are saturated with water are subjected to ground vibrations during a seismic event. Significant ground shaking causes soil to lose strength and "liquefy," triggering structural distress or failure due to the settling of the ground or a loss of strength in the soils underneath structures.

As shown on Figure 6-3, *Liquefaction Potential,* the northern and eastern areas of the city have the possibility of being affected by liquefaction. However, this hazard is considered low in the Palm Springs area because the approximate depth to groundwater is greater than 50 feet. Research and historical data indicate that loose, granular materials saturated with groundwater and at depths of less than 50 feet, with silt and clay contents of less than 30 percent are most susceptible to liquefaction. Shallow groundwater is in the downtown area immediately surrounding the Agua Caliente Springs, which can increase the potential for liquefaction. A strong earthquake could cause liquefaction in this area, most likely expressed as "sand volcanoes" immediately surrounding the spring. Seasonal fluctuations in groundwater levels and the introduction of residential irrigation increase liquefaction risk.

Figure 6-3 Liquefaction Potential



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Earthquake-Induced Slope Failures and Landslides

Strong ground motions can worsen existing unstable slope conditions, particularly if coupled with saturated ground conditions. Earthquake-induced slope failures generally include rock falls, landslides, and debris flows that can overrun structures, people, or property; sever utility lines; or block roads, which can hinder rescue operations after an earthquake. After the 1986 North Palm Springs earthquake, numerous landslides consisting primarily of debris slides and rockfalls were reported over an area of 232 square miles.

The southern part of Palm Springs is most vulnerable to seismically induced slope failure due to the steep terrain of the San Jacinto Mountains. The areas at the foot of the San Jacinto Mountains or below hills covered with large boulders are most susceptible to rockfall. In areas where there is development at the base of steep slopes, dislodged boulders can roll down to roadways, damaging roadways and destroying homes.

Earthquakes are likely to continue on an occasional basis and are likely to be moderate to severe based on the close proximity of the Garnet Fault, San Andreas Fault, and San Jacinto Fault. According to the Local Hazard Mitigation Plan, some earthquakes may cause moderate or complete damage to nearly 25 percent of the structures in the city. According to the United States Geologic Survey, there is a 25 percent chance of a 6.7 M_W or greater earthquake occurring from the San Andreas Fault and a 7 percent chance of a similar-size earthquake along the San Jacinto Fault by 2044. While liquefaction potential is low in most areas of the city, large earthquakes from faults such as the San Andreas Fault and San Jacinto Fault may cause significant damage to homes and businesses, and subsequently cause rockfalls or landslides.

Climate Change and Seismic Hazards

There is no substantial evidence of a link between climate change and seismic activity, so climate change is not expected to meaningfully change the frequency or intensity of hazards associated with seismic activity.

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GOAL SA2:

Minimized physical and environmental effects of seismic hazards in the city.

Policies

SA2.1 Require geologic and geotechnical investigations in areas of potential seismic hazards such as fault rupture, seismic shaking, liquefaction, and slope failure, as part of the environmental and/or development review process for all structures, and enforce structural setbacks from faults that are identified through those investigations in accordance with the Seismic Hazards Mapping Act. Require subsurface investigations of the Garnet Hill Fault if and as that area of northern Palm Springs is developed.

SA2.2 Coordinate with the National Earthquake Hazard Reduction Program of the Federal Emergency Management Agency, United States Geologic Survey, and the California Geologic Survey to identify earthquake risks and available mitigation techniques.

SA2.3 Enforce the requirements of the California Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning Acts when siting, evaluating, and constructing new projects within the city.

SA2.4 Disallow the construction of buildings designed for human occupancy within 50 feet of an active fault and prevent new critical, sensitive, and high-occupancy facilities from being located within 100 feet of a potentially active fault.

SA2.5 Require that engineered slopes be designed to resist earthquake-induced failure.

SA2.7 Maintain an ordinance for upgrading unreinforced masonry buildings and removing hazardous or substandard structures that may collapse in the event of an earthquake, in accordance with the Unreinforced Masonry Law that is tailored to the local conditions of Palm Springs.

SA2.8 Ensure that the highest and most current professional standards for seismic design are used in the design of Essential, Sensitive, and High-Occupancy facilities.

SA2.9 Require liquefaction-mitigation measures in the construction of bridges, roadways, major utility lines, or park improvements (e.g., bridges and trails) in potentially liquefiable areas, such as the Whitewater riverbed or at the mouths of canyons.

SA2.10 Encourage the local gas and water purveyors to review and retrofit their main distribution pipes, with priority given to the lines that cross or are near the mapped traces of the Banning and Garnet Hill Faults, in order to maintain essential facilities.

SA2.11 Participate in local, county, and State-sponsored earthquake preparedness programs.

GEOLOGIC HAZARDS

Geologic hazards generally consist of land movement processes not linked to seismic activity that have the potential to cause harm to people and property. In Palm Springs, these hazards include landslides and debris flows, ground subsidence, erosion, and windblown sand.

Landslides and Debris Flows

Landslides occur when a mountainside becomes unstable, causing soil and rocks to slide downslope. Landslides can include rock falls, deep failures of slopes, and shallow debris flows. Landslides are most common on steep slopes and mountainsides made up of loose soil or other material where excavation and grading, drainage alterations, or changes in vegetation have occurred. Intense rainfall and other environmental factors can also cause boulders to fall or roll down from these steep slopes, posing a threat to structures and people. Mountainsides commonly absorb water, which increases instability of the slope and may increase the risk of slope failure. Steep slopes made of loose or fractured material are more likely to slide. Planning for developments and infrastructure in these areas should be supported by site-specific geotechnical analyses for slope stability.

Figure 6-4, *Landslide Susceptibility,* shows the areas most susceptible to landslides in the city. Steeper slopes in the San Jacinto Mountain range are in high landslide susceptibility areas, and the flatter, urban area of Palm Springs is outside of this zone. Areas of high topographic relief, such as steep canyon walls, are most likely to be impacted by rockfalls, rockslides, soil slips, and to a lesser degree, large landslides. Likewise, locations in the Garnet Hill and Whitewater Hill areas have unstable soil types along which slope failures could occur.

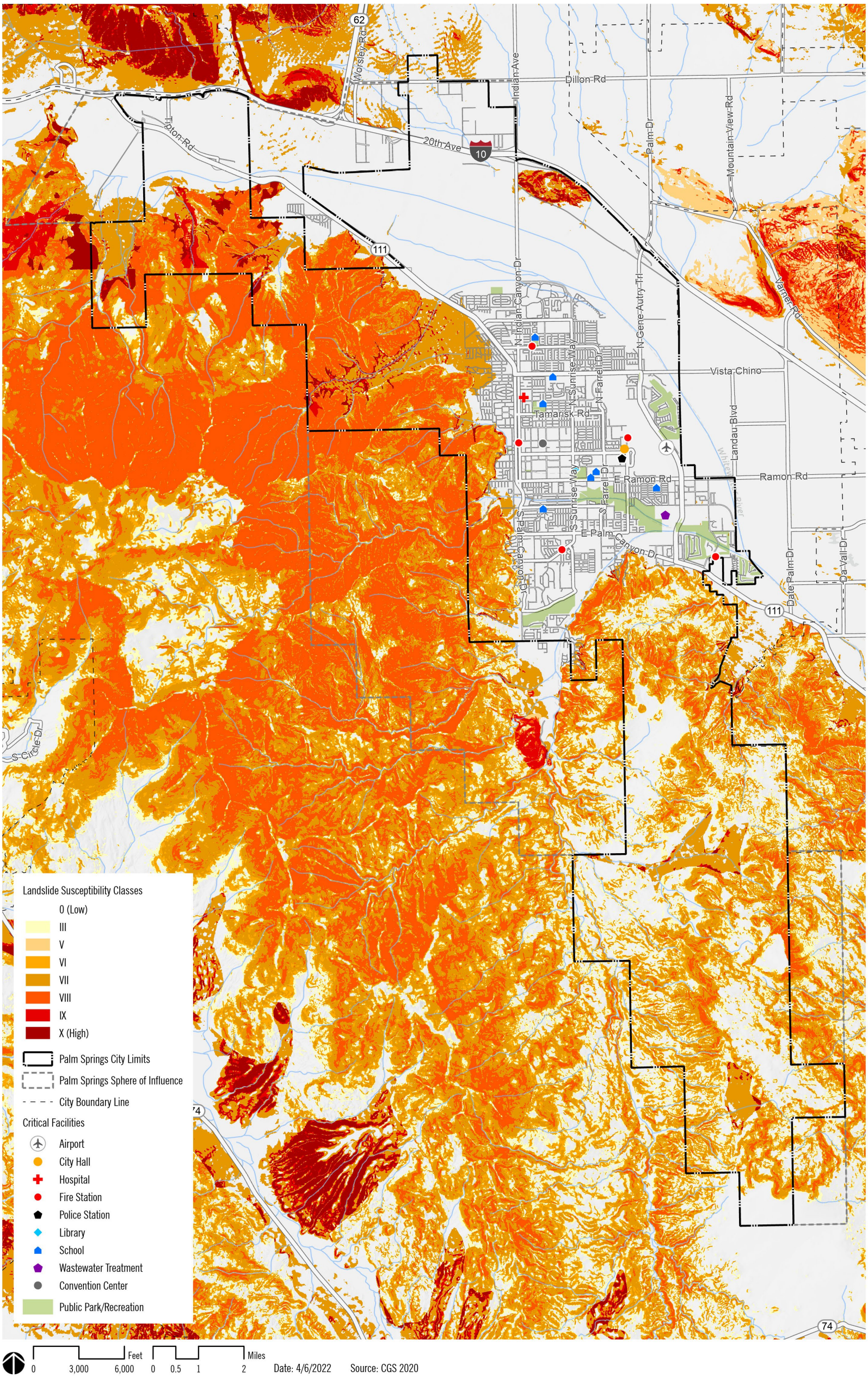
During exceptional storm periods or prolonged rainfall, the risk of debris flows increases. Debris flows are the most dangerous and destructive type of slope failure, generally consisting of a rapidly moving slurry of water, mud, rock, vegetation, and debris. This type of slope failure usually occurs during an intense rainfall event following saturation of the soil by previous rains.

Rockfalls are free falling or tumbling masses of bedrock that have broken off steep canyon walls or cliffs. Rockfalls can happen wherever fractured rock slopes have become steep from stream erosion or human activities. This hazard is present in the hills that frame the southern part of the Coachella Valley along the southwestern portions of Palm Springs. Rockfalls can occur suddenly and without warning but are more likely to occur in response to earthquake-induced ground shaking, during periods of intense rainfall, or as a result of human activities such as grading and blasting.

Ground Subsidence

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. In the areas of southern California where ground subsidence has been reported, this phenomenon is usually associated with the extraction of oil, gas, or groundwater or the organic decomposition of peat deposits. Ground subsidence can also occur as a response to natural forces such as earthquake movements.

Figure 6-4 Landslide Susceptibility



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Ground subsidence can cause earth fissures, sinkholes, depressions, and disruption of surface drainage. Permanent (irreversible) subsidence can occur if groundwater is removed from clay and silt layers in an underlying aquifer. The Indio Subbasin of the Coachella Valley Groundwater Basin is managed by water service agencies in the region, and the portion under Palm Springs is managed by the Desert Water Agency to minimize ground subsidence. Since 2010, the Indio Subbasin has had rises in groundwater—from 7 to 40 feet—due to groundwater management practices and reductions in overall water use. This trend has minimized subsidence throughout the city.

Erosion and Sedimentation

Erosion, the removal of earth materials by moving water, wind, or ice, is a significant geologic hazard in the Palm Springs area due to topography and weather conditions. Erosion and sedimentation are influenced by several factors, including climate, topography, soil and rock types, and vegetation. Natural erosion processes are often accelerated through human activities—agricultural or related to land development. Grading increases the potential for erosion and sedimentation by removing protective vegetation, altering natural drainage patterns, compacting the soil, and constructing cut-and-fill slopes, which may be more susceptible to erosion than the natural condition.

Because of the high topographic relief in and around Palm Springs, erosion and ***sedimentation*** are significant elements of the natural setting. Erosion may eat away at the mountains of western Palm Springs, and sedimentation may deposit the eroded material into eastern Palm Springs via water or wind. Erosion and sedimentation are also important factors to consider when developments are adjacent to slopes and drainage channels, not only during the design of a project, but also during construction and long-term maintenance of the developed site. Development can minimize the impacts of sedimentation by increasing permeable surfaces on a project site to decrease flooding and sedimentation downstream of the project.

Sedimentation: The depositing of sand and other earth materials carried by erosion processes.

Windblown Sand

Strong winds are endemic to the Palm Springs area due to the tunneling effect of air through the narrow San Gorgonio Pass. Wind can damage land and vegetation, and in this region, where surface sediments are predominantly dry and granular, windblown sand and

dust can impact surface improvements, air quality (creating health hazards), and visibility. These winds can also pick up dust and particulate matter from the desert or dry lakebed of the Salton Sea, causing sandstorms with toxic particulate matter.

Wind erosion commonly occurs in flat, bare areas; dry, sandy soils; or anywhere the soil is loose, dry, and finely granulated. Wind erosion damages land and natural vegetation by removing soil from one place and depositing it in another. Since high winds blow down the center of the Coachella Valley, recreational and resort communities that first developed in the upper Coachella Valley were generally in areas sheltered from these winds, tucked in coves at the base of the mountains. However, as the area has grown, development has had to move into the central axis of the valley and into the high-wind areas. Most of the urban development in Palm Springs lies in an area of high susceptibility to wind erosion. Recreational land uses, especially use of off-road vehicles, can also accelerate erosion in the area.

Windblown sand hazard along Indian Canyon Drive.

Wind and windblown sand pose an environmental hazard throughout the Coachella Valley. Buildings, fences, roads, crops, automobiles, trees, and shrubs can all be damaged by abrasive blowing soil. In some places, windblown sand has actually forced the abandonment of dwellings and subdivided tracts in the central Coachella Valley. In Palm Springs, windblown sand has repeatedly caused the closure of roads, costing the City thousands of dollars in cleanup. The roads with the most frequent closures include Indian Canyon Drive, Gene Autry Trail, and Vista Chino.

Climate Change and Geologic Hazards

Geologic hazards may increase due to increases in severe weather and heavy precipitation events due to climate change. Scientists project that climate change will increase the frequency and intensity of heavy rainfall in Palm Springs, which will likely increase landslides, debris flows, erosion, and sedimentation. More frequent drought conditions could lead to a heavier reliance on groundwater, increasing the probability of ground subsidence. As described in the Inland Desert Summary Report from the *California Fourth Climate Change Assessment,* the connection between climate change and severe winds is not as well established as other hazards, but new

evidence suggests that these forms of severe weather may occur more often than in the past.

GOAL SA3:

A city protected, to the greatest extent possible, from geologic hazards.

Policies

SA3.1 Minimize grading and other changes to the natural topography to protect public safety and reduce the potential for property damage as a result of geologic hazards.

SA3.2 Limit the development of permanent slopes to the inclinations permitted by building codes.

SA3.3 In the areas of Palm Springs susceptible to landslide hazards (see Figure 6-4), require geotechnical investigations that include engineering analyses of slope stability, surface and subsurface drainage specifications, potential impacts of slope failure to downslope properties, and detailed recommendations for fill placement and excavation as part of the environmental and/or development review process for all new or significant alterations to structures.

SA3.4 Prohibit the reconstruction of structures meant for human habitation that are damaged or destroyed by failed slopes unless the applicant can prove that the remedial measures proposed will improve slope conditions and make the site suitable for redevelopment.

SA3.5 Construct protective devices such as barriers, rock fences, retaining structures, or catchment areas in areas susceptible to rockfalls and/or landslides.

SA3.6 Participate in regional programs designed to protect groundwater resources and the regional groundwater basin from the hazard of regional ground subsidence.

SA3.7 Protect slopes from the effects of erosion by directing surface water away from slope faces and planting slopes with drought-resistant, ground-covering vegetation.

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SA3.8 Prohibit the construction of hilltop homes or structures above natural slopes at the head of steep drainage channels or gullies.

SA3.9 Ensure that structures placed near the bases of slopes or the mouths of small canyons, swales, washes, and gullies are protected from sedimentation.

SA3.10 Encourage the incorporation of wind barriers, architectural design or features, and drought-resistant ground coverage in new development site designs to mitigate the impacts from erosion and windblown sand.

FLOOD AND DAM INUNDATION HAZARDS

Flooding

The City of Palm Springs, like most communities in southern California's desert climate, is subject to unpredictable seasonal rainfall. Most years the scant winter rains are barely sufficient to turn the hills green for a few weeks, but every few years the region is subjected to periods of intense and sustained precipitation that results in flooding. The Federal Emergency Management Agency (FEMA) cites that flooding is one of the most destructive natural hazards in the world, responsible for more deaths per year than any other hazard. Major flooding occurred in Palm Springs in 1938, when the Whitewater River flooded the Coachella Valley. Overflow from the Tachevah Creek caused major flooding in Downtown Palm Springs and people in the city were isolated for nearly a week. Similarly, in the winter of 1965, the Cottonwood Creek overflowed Interstate 10 east of Highway 111, blocking traffic and isolating the City of Palm Springs. More recently, heavy rainfall created major flooding events in December 2010, September 2014, and February 2019. Therefore, the potential for flooding is a safety concern that Palm Springs continues to address.

Portions of Palm Springs are susceptible to storm-induced flooding of the San Gorgonio River, Whitewater River, and other drainages that extend across the city. Palm Springs is susceptible to ***flash flooding***, since the local mountains are very steep and consist of rock types that are fairly impervious to water, meaning that little precipitation is absorbed into the ground. Instead, rainwater and snowmelt flow across the surface as runoff, collecting in the major drainages that

Flash Flooding: Occurs during periods of heavy precipitation or snowmelt when rapidly moving high volumes of water flow downward from the mountains into the valley, often carrying mud, sand, and rock fragments.

100-Year Floodplain: Land that is subject to flooding by a 100-year flood or the flood elevation that has a 1 percent chance of being equaled or exceeded each year.

500-Year Floodplain: Land that has the potential to be flooded in a storm that has a 0.2 percent chance of occurring each year.

pass through the city. Because of the steep terrain and scarcity of vegetation, water from major storms can collect rapidly and run off quickly, overcoming human-made and natural channels and resulting in flash flooding.

Flooding is also expected to occur on the alluvial fans that the developed part of the city occupies, primarily from stormwater. Flood-control structures built and maintained by the Riverside County Flood Control and Water Conservation District (RCFCWCD) have helped reduce flood damage in the city since they were installed. Outside of the developed area of the city, most drainage channels are still in their natural state. Due to the construction of flood-control structures, sheet flow in most of these areas is estimated to be infrequent in occurrence and less than one foot deep. FEMA and the California Department of Water Resources has identified ***100-*** and ***500-year flood*** zones, which are shown on Figure 6-5, *Flood Hazards*. These include the Whitewater and San Gorgonio River floodplains and areas along Snow Creek, Blaisdell Creek, Chino Creek, Palm Canyon Wash, and Tahquitz Creek. Some developed areas in southern Palm Springs are within the 100-year and 500-year floodplain, as are several areas outside of the highly developed portion of the city. The mountains surrounding the developed portions of Palm Springs have the potential to increase flood problems by filling or plugging structures meant to convey water through the city.

Figure 6-5 identifies areas within the city that have the potential to be impacted in the event of a 100- or 500-year flood. FEMA's Flood Insurance Rate Maps (FIRMs) provide more detailed flood hazard map information. FIRMS are available for reference from FEMA.

Flood damage to Indian Avenue by the 1965 Whitewater River floodwaters caused the road to be closed for 30 days, adding to the isolation of Palm Springs*. (Source: RCFCWCD)*

The ***National Flood Insurance Program*** makes federally subsidized flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. Owners of all structures within the FEMA-mapped 100-year flood hazard areas are required to purchase and maintain flood insurance as a condition of receiving a federal mortgage or home equity loan on that structure. National flood insurance is available in the City of Palm Springs; homeowners within the 500-year flood zones, and even outside these zones, should be encouraged to buy flood insurance. Chapter 8.68, *Flood Damage Prevention,* of

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the City Municipal Code contains additional regulations designed to reduce the impacts of flood hazards. The City has also adopted and is implementing a master drainage plan developed and adopted in conjunction with RCFCWCD.

Major flood control structures in the Palm Springs area include the Whitewater River Levee, the Chino Canyon Levee and Channel, Tahquitz Creek Levee, and the Palm Canyon Wash Levee. The levee between Palm Canyon Wash and Indian Drive, maintained by the RCFCWCD, protects the portion of the city south of the Whitewater River from flooding. The Chino Canyon Levee and Channel protect the northern part of the highly developed Palm Springs area from 100- and 500-year flooding from Chino Creek and the Whitewater River. The Palm Canyon Wash levee directs flows from Palm Canyon and Arenas Canyon northeastward to the Tahquitz Creek, then eastward to the Whitewater River. It provides 100-year storm protection on the north side of the channel down to Tahquitz Creek and on the south side of Tahquitz Creek channel to the Whitewater River.

Dam Inundation

Flood damage to Highway 111 from 1965 storms.
(Source: RCFCWCD)

Flooding resulting from dam failure is a potential hazard for the city. The Tachevah Creek Detention Reservoir and the Tahquitz Creek Debris Basin are two flood-control structures in the Palm Springs area required by the California State Water Code to be monitored for structural safety and that have the potential to pose a flooding risk to the city. General limits of flood hazard due to dam failure are shown on Figure 6-6, *Dam Inundation Areas.*

The Tachevah Creek Detention Reservoir, about 1,200 feet downstream from the mouth of Tachevah Canyon, is formed by a 42-foot-high embankment constructed of compacted earth fill and has a capacity of approximately 650 million gallons. This dam was built in 1964 and protects the highly urbanized central part of the city from floods and debris flows. Figure 6-6 shows the inundation path that would most likely occur in the event of dam failure at this facility.

Figure 6-5 Flood Hazards

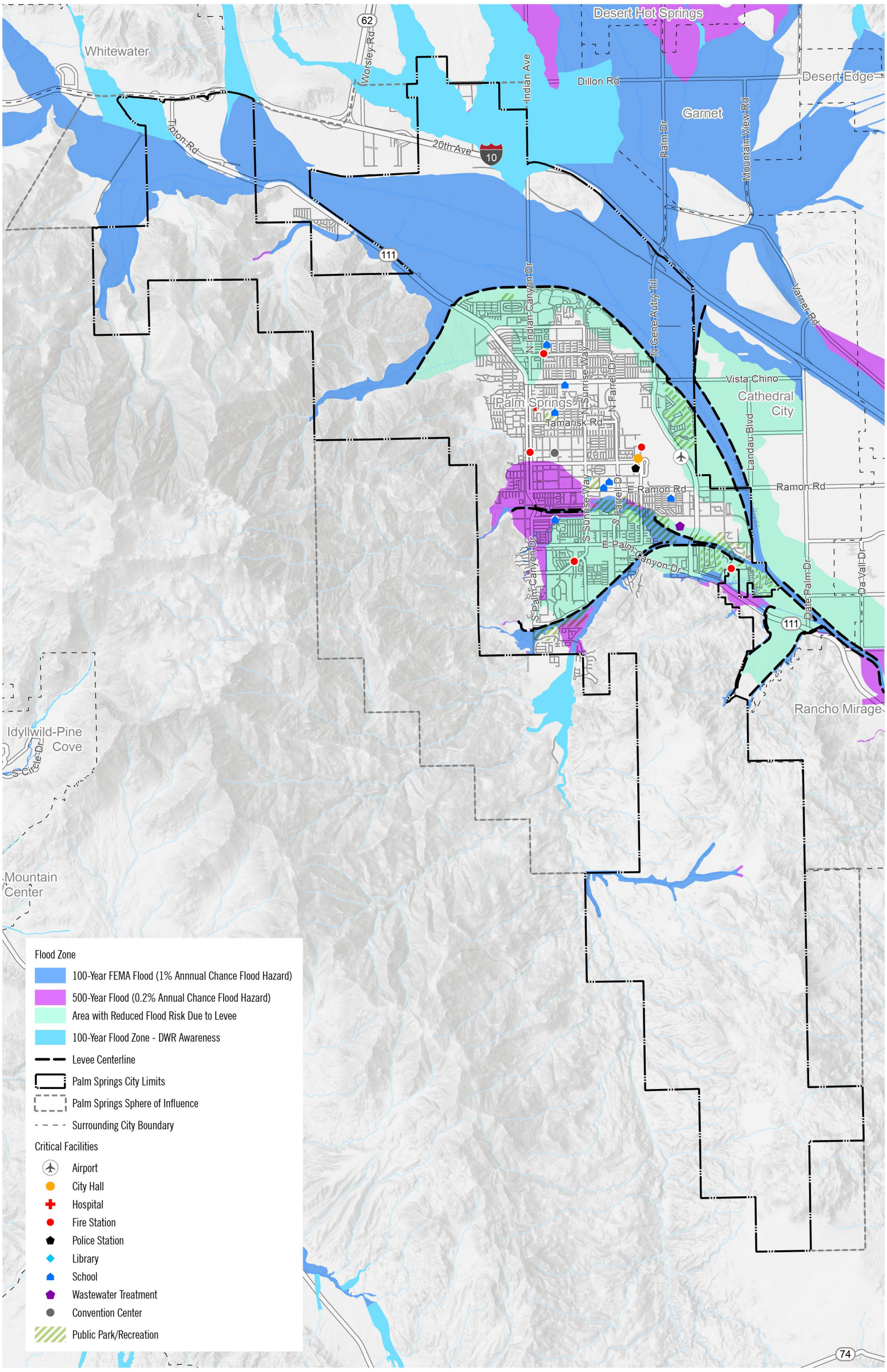

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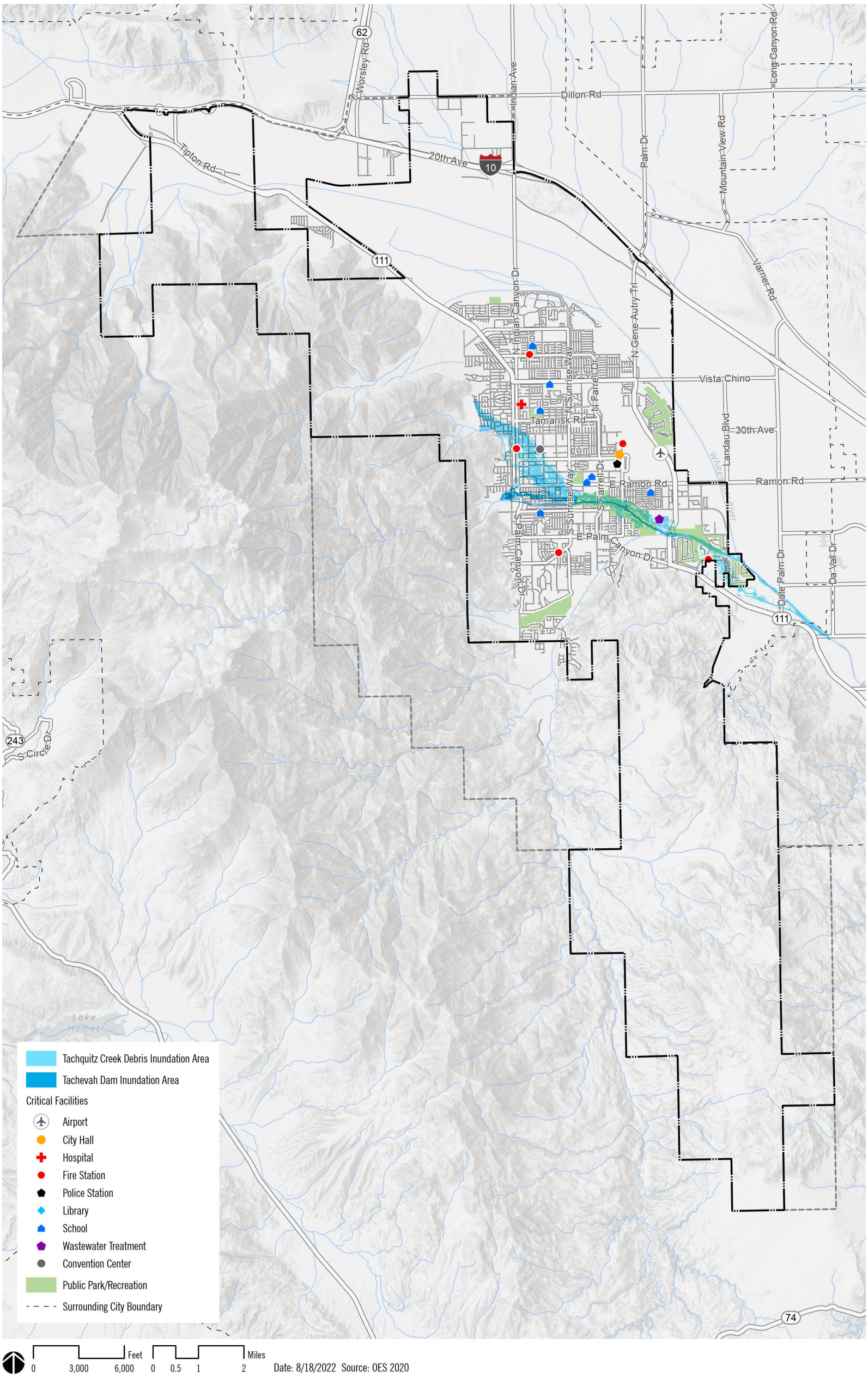
Figure 6-6 Dam Inundation Areas



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The Tahquitz Creek Debris Basin, which is a considerably smaller structure, was designed and constructed to reduce the risk of flooding that the Tahquitz Creek has historically posed to Palm Springs. Completed in May 1991 by the U.S. Army Corps of Engineers, the basin consists of a natural channel and dam with a debris storage capacity of about 33 million gallons and a two-mile reach of grass-lined channel used as a golf course and bicycle and equestrian trails.

Inundation from Aboveground Storage Tanks

Inundation from aboveground storage tanks is another safety consideration for the City of Palm Springs. Flooding can occur if strong ground shaking causes structural damage to aboveground water tanks. Sloshing water can lift a water tank off its foundation or break the pipes leading to the tank, releasing water to surrounding areas. All water tanks in the City of Palm Springs are owned and operated by the Desert Water Agency and meet or exceed the design standards and safety requirements applicable at the time the tanks were constructed.

Flooding along Indian Canyon Drive, January 11, 2005.

Seiche Potential

A seiche is an earthquake-generated wave occurring in an enclosed body of water, such as a lake, reservoir, or harbor. Ground shaking caused by earthquakes can cause oscillations, or sloshing, in enclosed bodies of water, forming a wave that may spill over and flood adjacent land uses. In the Palm Springs area, seiching is not anticipated to pose a significant risk to facilities such as recharge basins and human-made lakes due to their shallow nature and the quick absorption of water into the sandy underlying surfaces. The City of Palm Springs does not have open reservoirs. However, sloshing within a steel water storage tank can cause damage or failure of the structure. Seiching in swimming pools can also occur, and since pools are relatively deep, it is not unusual for pool owners to report a loss of one or more feet of water due to sloshing during an earthquake.

Climate Change and Flood and Dam Inundation Hazards

Although climate change may not change average precipitation levels significantly, scientists expect that it will cause more years with

extreme precipitation events. This means that more years are likely to see intense storm systems that drop precipitation over a short enough period to overwhelm storm drain systems and flood protection infrastructure, leading to more frequent flash flooding. Because of this, floods are expected to occur more often in Palm Springs, and climate change may expand the parts of the city that are considered flood prone. Although there are no specific flooding projections for the city, flood events are expected to become more frequent, and it is possible that the areas subject to flooding will expand.

While the risk and associated short- and long-term impacts of climate change are uncertain, experts in this field tend to agree that among the most significant impacts include those resulting from increased heat and precipitation events that cause increased frequency and magnitude of flooding. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life. Displacement of residents can include both temporary and long-term displacement, increase in home and renters' insurance rates, or restriction of insurance coverage in vulnerable areas.

Master Drainage Plan: Addresses the current and future drainage needs of a given community. The plan includes an inventory of existing and proposed drainage facilities, and an estimate of facility capacities, sizes, and costs. The plan provides a guide for the orderly development of the plan area, provides an estimate of costs to resolve flooding issues, and can be used to establish Area Drainage Plan fees.

Area Drainage Plan: A financing mechanism used to offset taxpayer costs for proposed drainage facilities by which fees are imposed on new development within the plan area.

GOAL SA4:

Minimized risk to life, property, and essential facilities from flooding and other hydrological hazards within the city.

Policies

SA4.1 Evaluate all development proposals located in areas that are subject to flooding for consistency and compliance with the flood damage prevention standards in the Municipal Code to minimize the exposure of life and property to potential flood risks.

SA4.2 Require that future planning for new development consider the impact of increased pervious surfaces on downstream flooding as well as the impact of flood control structures on the environment, both locally and regionally.

SA4.3 Continue to work with the Federal Emergency Management Agency, Riverside County Flood Control and Water Conservation District, the Coachella Valley Water District, and the United States Army Corps of Engineers to

receive and implement updated flood-control measures and information.

SA4.4 Coordinate with Riverside County Flood Control and Water Conservation District to provide drainage controls and improvements that enhance local conditions and are consistent with and complement the Regional ***Master Drainage Plan*** and ensure that updated and effective Master Drainage Plans are implemented in a timely fashion.

SA4.5 Provide direction and guidelines for the development of on-site stormwater retention facilities consistent with local and regional drainage plans and community design standards.

SA4.6 Use nature-based solutions and green infrastructure to the extent feasible to design flood-control facilities so that biological impacts are minimized and locally significant habitat is either avoided or replaced.

SA4.7 Discourage the introduction of flood-control measures in the undeveloped areas of Palm Springs at the expense of environmental degradation.

SA4.8 Continue to leave existing watercourses and streams natural wherever possible by developing them as parks, nature trails, or passive or active recreation areas that could withstand inundation and provide for their enhancement as wildlife habitat.

The Tahquitz River is an example of a watercourse along which there are recreational opportunities for the City.

SA4.9 Ensure that design opportunities for enhanced open space and recreation amenities, including habitat enhancement, hiking, and equestrian trails, are fully explored and incorporated when designing and constructing channels, debris and detention basins, and other major drainage facilities, to the greatest extent practical, in coordination with the Coachella Valley Water District and the Riverside County Flood Control and Water Conservation District.

SA4.10 Require xeriscape in open space areas in new development, provide the maximum permeable surface

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area to reduce site runoff, and prohibit unnecessary paving.

SA4.11 Continue to participate in the National Flood Insurance Program.

SA 4.12 Minimize impervious areas by requiring development to include low impact development and green infrastructure that increase pervious surfaces to absorb impacts from stormwater and flooding.

URBAN FIRE AND WILDFIRE HAZARDS

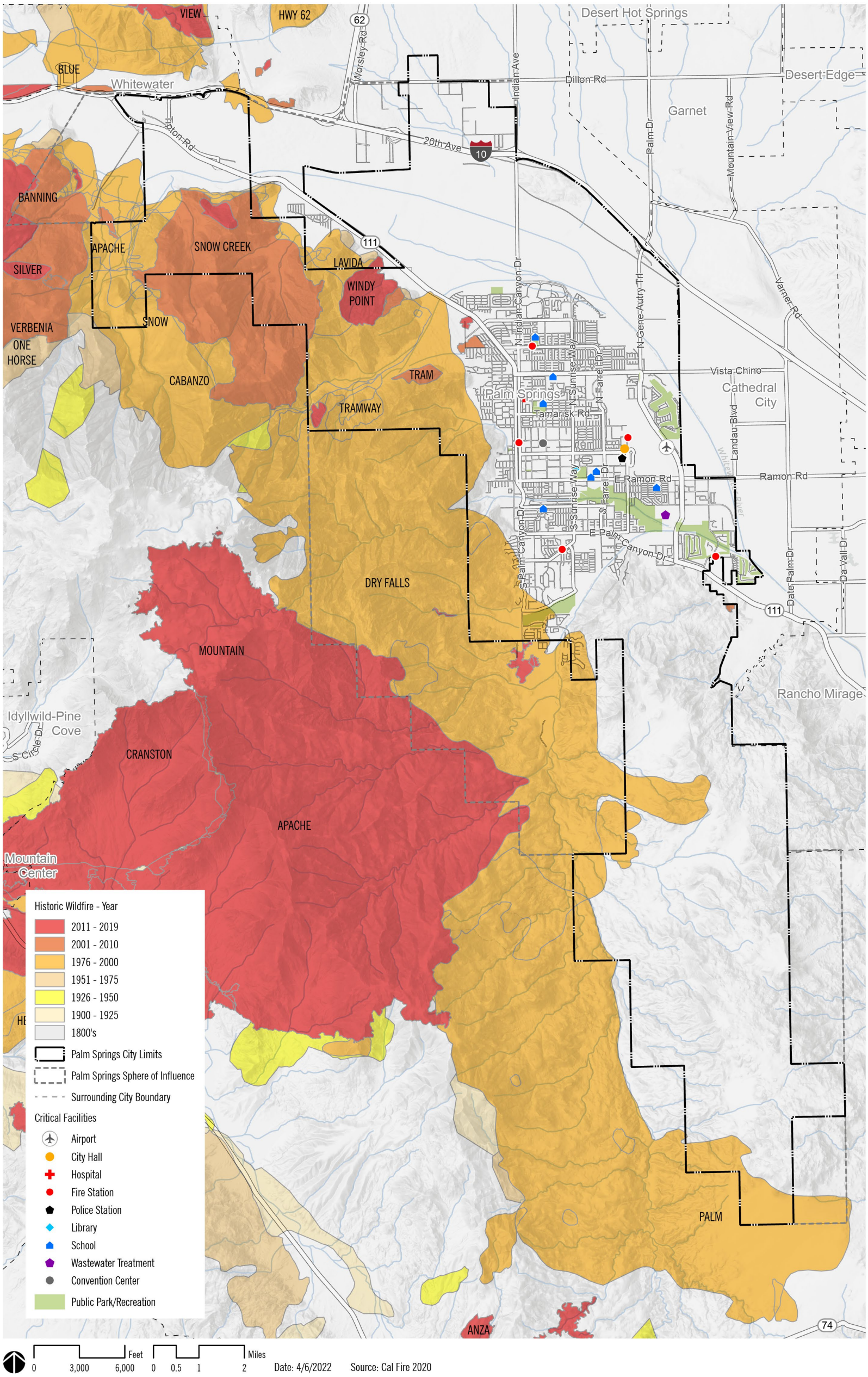
The Blaisdell Canyon Fire came close to the Palm Springs Aerial Tramway on August 28, 2005. *(Source: Jay Calderon, The Desert*

Wildfires

Wildfires are a significant hazard in California, where they have always been part of the natural environment. Large areas of southern California are particularly susceptible to wildfire due to the region's weather, topography, and native vegetation. The typically mild winters characteristic of the region's Mediterranean climate result in an annual growth of grasses and plants that dry out during the hot summer months. This dry vegetation provides fuel for wildfires in the autumn, when the area is intermittently impacted by Santa Ana winds—the hot, dry winds that blow across the region in the late fall. Although dangerous, wildland fire is a natural process and a necessary part of the natural ecosystem of southern California.

Relatively few wildland fires have occurred in the urbanized areas of Palm Springs within the past ten years. However, as shown on Figure 6-7, *Historic Wildfire Perimeters,* there have been six major fires near Palm Springs in recent decades. Between 1980 and 1994, three very large wildfires occurred in the San Jacinto Mountains and foothills along the western border of Palm Springs and its sphere of influence—the Dry Falls fire of 1980, the Tram Fire of 1985, and the Palm Fire of 1994. The Blaisdell Canyon Fire of 2005 burned more than 5,000 acres in the mountains above Palm Springs proper, threatening the Palm Springs Aerial Tramway area. In 2014, the Mountain Fire burned land directly to the east of the city in the San Jacinto Mountains, and in 2020, the Snow Fire burned areas in northern Palm Springs near the San Gorgonio Pass. Fortunately, these fires were mostly limited to undeveloped areas of mountainous terrain.

Figure 6-7 Historic Wildfire Perimeters



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As shown on Figure 6-8, *Fire Hazard Severity Zones*, the western and southwestern portions of the city, specifically the neighborhoods along the foothills and canyon mouths, are in Very High Fire Hazard Severity Zones. The areas with more vegetation—such as in the lower canyon reaches draining the San Jacinto Mountains, including Tachevah Canyon, Tahquitz Creek, Andreas Canyon, and Palm Canyon—where water may be more plentiful, are also highly susceptible to wildfires. The Palm Springs Fire Department is responsible for fire protection, planning, and response within these areas. The San Jacinto Mountains to the west of the city limits are in State Responsibility Areas for fire protection and contain lands within Very High, High, and Moderate Fire Hazard Severity Zones. The California Department of Forestry and Fire Protection (CAL FIRE) provides fire protection services in these areas. Figure 6-8 also shows the Federal Responsibility Areas in hatched lines, indicating lands owned and managed by Agua Caliente Band of Cahuilla Indians, U.S. Forest Service, or Bureau of Land Management. The Agua Caliente Band of Cahuilla Indians is the largest single landowner in Palm Springs, and therefore the Federal Responsibility Area overlaps with the State and Local Responsibility Area Fire Hazard Severity Zones.

The wildland-urban interface (WUI) is an area where buildings and infrastructure (e.g., cell towers, schools, water supply facilities) mix with areas of flammable wildland vegetation. The WUI is composed of interface, intermix, and influence communities. The distinction between these is based on the characteristics and distribution of houses and wildland vegetation across the landscape. Hundreds of homes now border flammable vegetation areas in California. According to a publication in the *International Journal of Wildfire*, the interface WUI in California contained 50 percent of buildings destroyed by wildfire, whereas intermix WUI contained only 32 percent. Human-caused fires are the leading cause of wildland fires, and with thousands of people living near and visiting wildland areas, the probability of human-caused fires is growing. Figure 6-9, *Wildland-Urban Interface,* shows the WUI areas in Palm Springs. Interface areas are located along the mountainside generally south and west of Palm Canyon Drive. The influence zone is just to the west of the Interface zone, going up into the San Jacinto Mountains.

In the WUI, efforts to prevent ignitions and limit wildfire loss hinge on hardening structures and creating defensible space through a multi-faceted approach, which includes engineering, enforcement, education, emergency response, and economic incentive. Different

Defining the Wildland-Urban Interface

As shown on Figure 6-9, the wildland-urban interface is made up of three distinct zones:

1. **Intermix Zone.** Housing development or improved parcels interspersed in an area dominated by wildland vegetation subject to wildfire.
2. **Interface Zones.** Dense housing next to vegetation, but not dominated by wildland vegetation, that can burn in a wildfire.
3. **Influence Zone.** Wildfire-susceptible vegetation within 1.5 miles from the wildland-urban interface or wildland-urban intermix zones.

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strategies in the defense and threat zones of the WUI help to limit the spread of fire and reduce the risk to people and property.

Increasing local and regional fire frequency can create recurring air quality degradation events leading to respiratory health effects. Wildfire smoke consists of a mix of gases and fine particulate matter from burning vegetation and materials. The pollutant of most concern from wildfire smoke is fine particulate matter ($PM_{2.5}$). $PM_{2.5}$ from wildfire smoke is damaging to human health due to its ability to deeply penetrate lung tissue and affect the heart and circulatory system. Although wildfire smoke presents a health risk to everyone, sensitive groups may experience more severe acute and chronic symptoms from exposure to wildfire smoke, such as children, older adults, people with chronic respiratory or cardiovascular disease, or people experiencing low socioeconomic status.

Wildfire will continue to be a high-risk hazard for personal safety and property damage in Palm Springs, and smoke impacts from local and regional wildfires are likely to continue to be problematic.

Urban Fires

Palm Springs is also at risk from urban fires. These fires occur in built-up environments, destroying buildings and other human-made structures. Structural fires are often due to faulty wiring or mechanical equipment and combustible construction materials. The absence of fire alarms and fire sprinkler systems are often conditions that exacerbate the damages associated with a structural fire. Structural fires are largely from human accidents, although deliberate fires (arson) may be a cause of some events. Older buildings that lack modern fire safety features may face greater risk of damage from fires. In newer residential areas where construction includes fire-resistant materials and interior fire sprinklers, most structural fires can be confined to the building or property of origin. To minimize fire damage and loss, the City's Fire and Building Codes, based on the California Fire and Building Codes, set standards for building and construction. They require the provision of adequate water supply for firefighting, fire-retardant construction, minimum street widths, and defensible space requirements, among other things. The likelihood of structural fires in the city is lower than wildfires since these fires are usually associated with human accidents or mechanical issues in buildings that rarely happen.

Figure 6-8 Fire Hazard Severity Zones

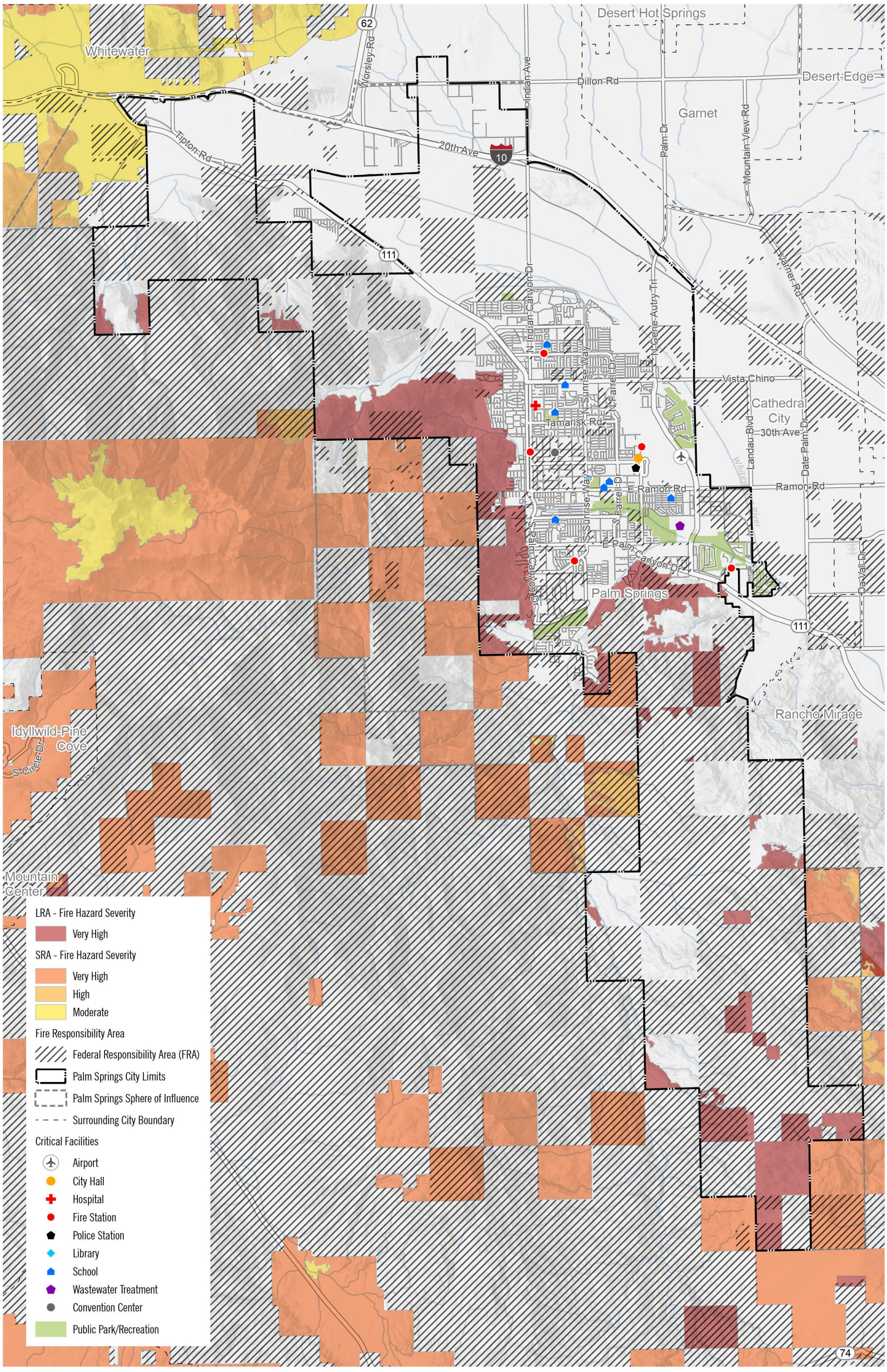

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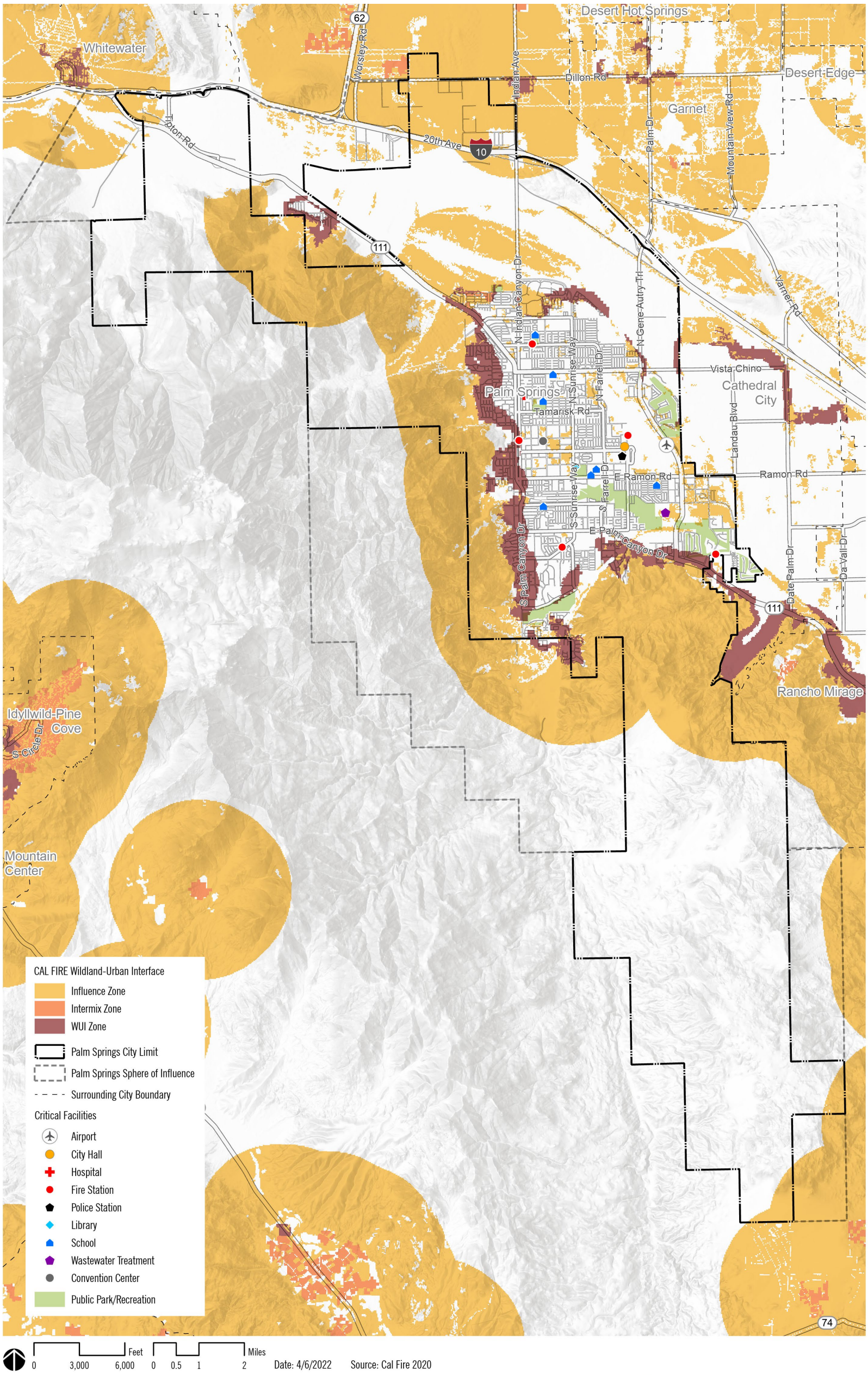
Figure 6-9 Wildland-Urban Interface



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Climate Change and Fire Hazards

Changing climate conditions are expected to increase the fire risk in and around Palm Springs. Warmer temperatures brought on by climate change can exacerbate drought conditions. Droughts can kill or dry out plants in the mountainous areas of the city, creating more fuel for wildfires. Hot, dry spells may also increase disease and insect infestations resulting in higher fuel loads in juniper woodlands. Increased winds may result in more erratic fire behavior, making fires harder to contain. Warmer temperatures are also expected to occur during more of the year, extending the wildfire season, which is likely to begin earlier in the year and extend later than it has historically. Wildfires occurring later or earlier in the year are more likely to occur during Santa Ana wind events, which can cause wildfires to move more quickly and increase the likelihood of burning in the WUI areas.

Earthquake-Induced Fires

Although wildland fires can be devastating, ***earthquake-induced fires*** have the potential to generate the worst-case fire-suppression scenarios for a community because an earthquake typically causes multiple ignitions over a broad geographic area. If fire fighters are involved in search and rescue operations they are less available to fight fires, and the water distribution system could be impaired, limiting fire-suppression efforts even further. If earthquake-induced fires occur during Santa Ana wind conditions, the results can be far worse.

Earthquake-Induced Fires in Palm Springs: Two earthquake-induced fires in Palm Springs were caused by the 1992 Landers/Big Bear Earthquake.

There are some areas in Palm Springs where breaks in gas mains and the water distribution system caused by an earthquake could lead to a significant fire danger. A moderate to strong earthquake on any of the faults that affect the city could trigger multiple fires, disrupt lifelines services (such as the water supply), and trigger other geologic hazards, such as landslides or rockfalls, which could block roads and hinder disaster response. Therefore, the capacity of water systems to provide sufficient water to fight fires is a significant issue.

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GOAL SA5:

Palm Springs residents, business owners, and visitors protected from urban fire and wildfire hazards.

Policies

SA5.1 Support brush removal and weed abatement in developed areas to minimize fire risk, and coordinate with the Riverside County Fire Department Hazard Reduction Office for brush removal in areas outside of the city limits.

SA5.2 Require property owners of existing and new development in Very High Fire Hazard Severity Zones or the Wildland-Urban Interface, as shown on Figure 6-8 and Figure 6-9, to create and maintain community fire breaks and defensible space around structures that is free from dry brush and other flammable materials and to comply with the 100-foot Defensible Space Requirement in the Public Resources Code (PRC 4291), the 200-foot defensible space requirement of Fire Department Ordinance No.2009, and Government Code (GC 51182) for fuel modification to reduce fire danger.

SA5.3 Continue to refine procedures and processes to minimize the risk of fire hazards by requiring new and existing development to:

- Utilize fire-resistant building materials.
- Incorporate fire sprinklers as appropriate.
- Incorporate defensible-space requirements;
- Comply with Riverside County Fuel Modification Guidelines.
- Comply with CAL FIRE Fire Safe Regulations and Fire Hazard Reduction Around Buildings and Structures Regulations.
- Provide Fire Protection Plans.
- Comply with the California Building Code and California Fire Code.
- Allow for adequate access of emergency vehicles.
- Develop fuel modification in naturalized canyons and hills to protect life and property from wildland fires, yet leave as much of the surrounding natural vegetation as possible.

- Use selective trimming and obtain permits when necessary in designated areas to preserve environmentally sensitive native plants.

SA5.4 Encourage owners of unsprinklered properties, especially midrise structures and high-occupancy structures, to retrofit their buildings and include internal fire sprinklers.

SA5.5 Ensure that public and private water distribution and supply facilities have adequate capacity and reliability to supply both everyday and emergency firefighting needs.

SA5.6 Utilize reservoirs, tanks, and wells, as needed, for emergency fire suppression water sources.

SA5.7 Ensure that fuel modification is consistent with any adopted habitat-conservation plans.

SA5.8 Coordinate with Riverside County Fire Department, CAL FIRE, and the U.S. Forest Service to conduct fuel modification projects.

MSA5.9 Continue public education efforts to inform residents, business owners, and visitors of fire hazards and measures to minimize the damage caused by fires to life and property.

SA5.10 Analyze the site plan layout for new projects to ensure they provide an adequate amount of defensible space around structures.

SA5.11 Develop an ongoing fire protection water system program that will provide adequate water supply for firefighting purposes within the city.

SA5.12 Require all new commercial and multiple-unit residential development to install fire protection systems and encourage the use of automatic sprinkler systems.

SA5.13 Require all new construction to use noncombustible roofing materials.

SA5.14 Developers of property on or abutting hillsides shall implement, with consultation and approval from the City Fire Department, a safety buffer zone, otherwise known as a fuel-modification zone, between natural open space and

planned development to lessen the fire hazard potential in these interface areas.

SA5.15 Obtain a Board of Forestry and Fire Protection Fire Risk Reduction Community designation.

SA5.16 Avoid new residential development in Very High Fire Hazard Severity Zones.

SA5.17 Require new nonresidential development within a Very High Fire Hazard Severity Zone and the Wildland Urban Interface to have at least two egress and ingress options, visible street signs that identify evacuation routes, visible home numbering, and adequate water supply for structural suppression.

SA5.18 Require redevelopment after wildfires to meet current California Building Code, California Fire Code, and California Fire Safe Standards to reduce future vulnerabilities to fire hazards through site preparation, layout design, fire-resistant landscaping, and fire-retarding building design and materials.

SA5.19 Coordinate with local, state, and federal agencies to stabilize burned slopes after a wildfire.

SA5.20 Require new development within Very High Fire Hazard Severity Zones or the Wildland-Urban Interface to prepare a fire safety plan.

HAZARDOUS MATERIALS AND WASTE

Palm Springs has many businesses that manufacture, transport, store, use, and dispose of hazardous materials. The city, therefore, has the potential to be affected by a major hazardous material emergency or affected in general by hazardous materials and waste.

In Palm Springs are several identified hazardous or toxic materials sites associated with commercial, industrial, quasi-industrial, and medical operations and processes, which have the potential for accidental spills, purposeful illegal dumping, air emissions, and other uncontrolled discharges into the environment. Only one transporter of hazardous waste is listed by the EPA in the Palm Springs area.

Most of the hazardous materials generators within the city are within five miles of the Garnet Hill and Banning Faults, which have a relatively high probability of generating an earthquake in the next 30 years. Several of the hazardous materials facilities have been identified as being located between the 100- and 500-year floodplain for the Whitewater River. Therefore, all of the hazardous materials sites within the city could be subject to moderate to severe seismic shaking or flooding.

Transport of Hazardous Materials

State Highway 111, Interstate (I-)10, and the Union Pacific Railroad corridor are all used to transport hazardous materials through the city. These areas have the highest likelihood of potential spills or leaks. The California Highway Patrol coordinates response to spills in or along freeways, with Caltrans, local police departments, and fire departments responsible for providing additional enforcement and routing assistance. Additionally, natural gas transmission pipelines extend across the city and sphere of influence north of I-10. Rupture of any portion of these pipelines would adversely impact the area.

Surface and Subsurface Groundwater Contamination

Other potential hazards to Palm Springs include groundwater and drinking-water pollution, leaking underground fuel tanks, household hazardous waste, and old landfill sites.

The City of Palm Springs is a co-permittee and the local enforcing agency for the National Pollutant Discharge Elimination System

(NPDES). The NPDES requires the development, adoption, and implementation of plans and programs for stormwater management which prohibits non-stormwater runoff into storm drains and seeks to reduce and eliminate the discharge of pollutants to local groundwater and nearby bodies of water.

The Desert Water Agency (DWA) provides drinking water to the City of Palm Springs. According to the EPA Safe Drinking Water Violation Report, the DWA has not had a health violation since 1993, the earliest date for which records are available.

Residents of Palm Springs can safely dispose of hazardous household materials at the ABOP Collection Center at the Palm Springs Fire Department Training Facility, 3000 East Alejo Road.

In accordance with the California Integrated Solid Waste Management Act of 1989, the Riverside County Department of Environmental Health, Hazardous Materials Management Division (DEH-HMMD) adopted a Household Hazardous Waste (HHW) program, called ABOP (antifreeze, batteries, oil, and paint) to promote the recovery and recycling of hazardous materials and prevent groundwater contamination. The City of Palm Springs participates in the program and has an HHW drop-off facility at the Palm Springs Fire Department Training Center, 3000 East Alejo Road.

There are no active landfills in the Palm Springs area. Solid waste generated in Palm Springs is collected by the Palm Springs Disposal Service and deposited in the Edom Hill Transfer Station. Once sorted, solid waste is taken to the Lamb Canyon Landfill in Beaumont.

Hazardous Materials Management Plan

In response to the need for safe management of hazardous materials and waste products, Riverside County, along with Palm Springs and other cities in the county, have jointly developed the Riverside County Hazardous Waste Management Plan (HWMP) to address the disposal, handling, processing, storage, and treatment of local hazardous materials and waste products. The Riverside County HWMP ensures that adequate treatment and disposal capacity will be available to manage the hazardous wastes generated within each jurisdiction.

The Riverside County Department of Environmental Health, Hazardous Materials Division is the designated Certified Unified Program Agency for Riverside County and is responsible for coordinating hazardous material planning and response efforts with city departments as well as local and state agencies. The goal is to improve public and private sector readiness, and to reduce local impacts from hazardous materials and waste. The Hazardous

Materials Division of the Riverside County Fire Department deals with the hazardous materials coordination, hazardous materials business plans, and inspection in the city.

Climate Change and Hazardous Materials

Climate change is unlikely to directly affect hazardous materials transportation incidents. However, increases in the frequency and intensity of hazards such as floods, wildfire, landslides, and severe storms may create an indirect greater risk of hazardous materials releases during these events.

GOAL SA6:

Minimized risk of exposure of life, property, and the environment in Palm Springs to hazardous and toxic materials and waste.

Policies

SA6.1 Promote the proper disposal, handling, transport, delivery, treatment, recovery, recycling, and storage of hazardous materials in accordance with applicable federal, state, and local regulations.

SA6.2 Require businesses to utilize practices and technologies that will reduce the generation of hazardous wastes at the source.

SA6.3 Confer with Riverside County Environmental Health Department and the California Department of Toxic Substances and Control to determine the need for, and the appropriateness of, developing a permitting process for the establishment of facilities which manufacture, store, use, or dispose of hazardous and toxic materials within the community or adjacent areas.

SA6.4 Follow the response procedures outlined within the Riverside County Fire Department's Hazardous Materials Area Plan in the event of a hazardous materials emergency.

SA6.5 Establish transportation management and contingency emergency procedures and training programs for police, fire, medical, and other organizations that would be

involved in an airborne release or ground spill of hazardous and toxic materials or waste.

SA6.6 Ensure Fire Department staff has properly trained personnel and appropriate equipment to handle hazardous materials spills.

SA6.7 Cooperate with the California State Water Board and gasoline station owners and operators in monitoring the conditions of subsurface gasoline tanks, tracking leaks that may occur, and requiring the prompt removal of hazardous tanks.

SA6.8 Coordinate with the Riverside County Department of Environmental Health to regulate and limit the use of herbicides, pesticides, and other hazardous chemicals associated with the maintenance of landscaped areas in the city.

SA6.9 Work with the Riverside County Department of Environmental Health and Riverside County Fire Department, in coordinate with the Emergency Operations Plan, to implement effective emergency preparedness and emergency-response strategies to minimize the impacts to health and safety that can result from hazardous materials emergencies such as spills or contamination.

SA6.10 Prohibit the transport of hazardous waste materials through the city except along Highway 111, Interstate 10, and the Union Pacific Railroad.

SA6.11 Continue to partner with the County of Riverside to provide needed programs such as the Household Hazardous Waste ABOP Program to provide disposal of household hazards at no cost to Palm Springs residents and participating agencies.

SA6.12 Prohibit the location of facilities using, storing, or otherwise involved with substantial quantities of on-site hazardous materials in flood zones, unless all standards of elevation, anchoring, and flood-proofing have been satisfied and hazardous materials are stored in watertight containers that are not capable of floating.

AIRPORT SAFETY

Safety considerations for land uses immediately adjacent to the Palm Springs International Airport are especially important to the city. Figure 6-10, *Airport Compatibility Plan*, shows "compatibility zones," or areas where take-off and landing patterns create risks for people living and working in the area. The Riverside County Airport Land Use Compatibility Plan (RCALUCP) designates zones of airport influence in the city and offers policies and criteria to ensure compatibility between airports and surrounding land uses. The RCALUCP provides Basic Compatibility Criteria, which include such considerations as the prohibition of tall structures, hazardous materials storage, siting of high-occupancy buildings and facilities, and critical infrastructure within compatibility zones, as well as limits on dwelling units per acre and regulatory procedures for approval of land uses. The Palm Springs International Airport Master Plan guides future development within the airport itself and offers useful information for determining aircraft-related risks and hazards.

Part of the Aircraft Rescue Fire Fighting fleet, an ARFF 151. *(Source: City of Palm Springs Fire Department)*

In addition, considerations for development around airports include the potential for noise nuisance, the intensity of development, and the height of structures. Refer to Figure 6-10 for areas impacted by height-review overlay zones and land use compatibility zones surrounding the Palm Springs International Airport. Goals and policies related to potential noise impacts created by the airport, as well as noise contours for the airport facility, can be found in the Noise Element.

The Palm Springs Fire Department has provided Aircraft Rescue Fire Fighting (ARFF) services to the Palm Springs International Airport for over 60 years. Services provided include emergency medical services, fire protection services, fire protection planning, fire prevention, hazardous materials response, and public education.

Climate Change and Airport Safety

Climate change is unlikely to substantially affect airport infrastructure safety. However, increase in the number of extreme heat days of 115 to 120 degrees Fahrenheit can decrease the density of the air, making it difficult for larger aircraft to take off. Higher temperatures can also warp the runway surface, making it difficult to land, and preventing electronic equipment from cooling, preventing aircraft from taking off. Therefore, extreme heat is likely to cause more frequent delays and closure events of the Palm Springs International Airport.

GOAL SA7:

Minimized risk to life and property in Palm Springs associated with air transportation.

Airport Influence Area: Areas affected by airport operations. Noise, fumes, or hazards to aerial navigation are examples of factors that may define such an area. Generally defined, the airport influence area includes land within two miles of the airport boundary (California Public Utilities Code Section 21675.1 (b)).

Clear Zone: Area off the end of a runway used to enhance the protection of people and property on the ground.

Airport Surveillance Radar (ASR): A radar system that allows air traffic controllers to identify an arriving or departing aircraft's distance and direction from an airport.

Policies

SA7.1 Prohibit land uses in airport influence areas that are incompatible with airport uses or may create potential hazards to aviation.

SA7.2 Continue to coordinate development project review with the Airport Land Use Commission and FAA as required by the Riverside County Airport Land Use Compatibility Plan.

SA7.3 Maintain an Airport Emergency Operations Plan as required by FAA regulations.

SA7.4 Building heights within the airport ***clear zones*** shall conform to runway approach surfaces and ***ASR*** critical areas as stated in the Airport Master Plan.

POLICE AND FIRE SERVICES

Palm Springs Police Department Mission Statement

The men and women of the Palm Springs Police Department, empowered by and in partnership with the community, are dedicated to providing professional, ethical, and courteous service to all.

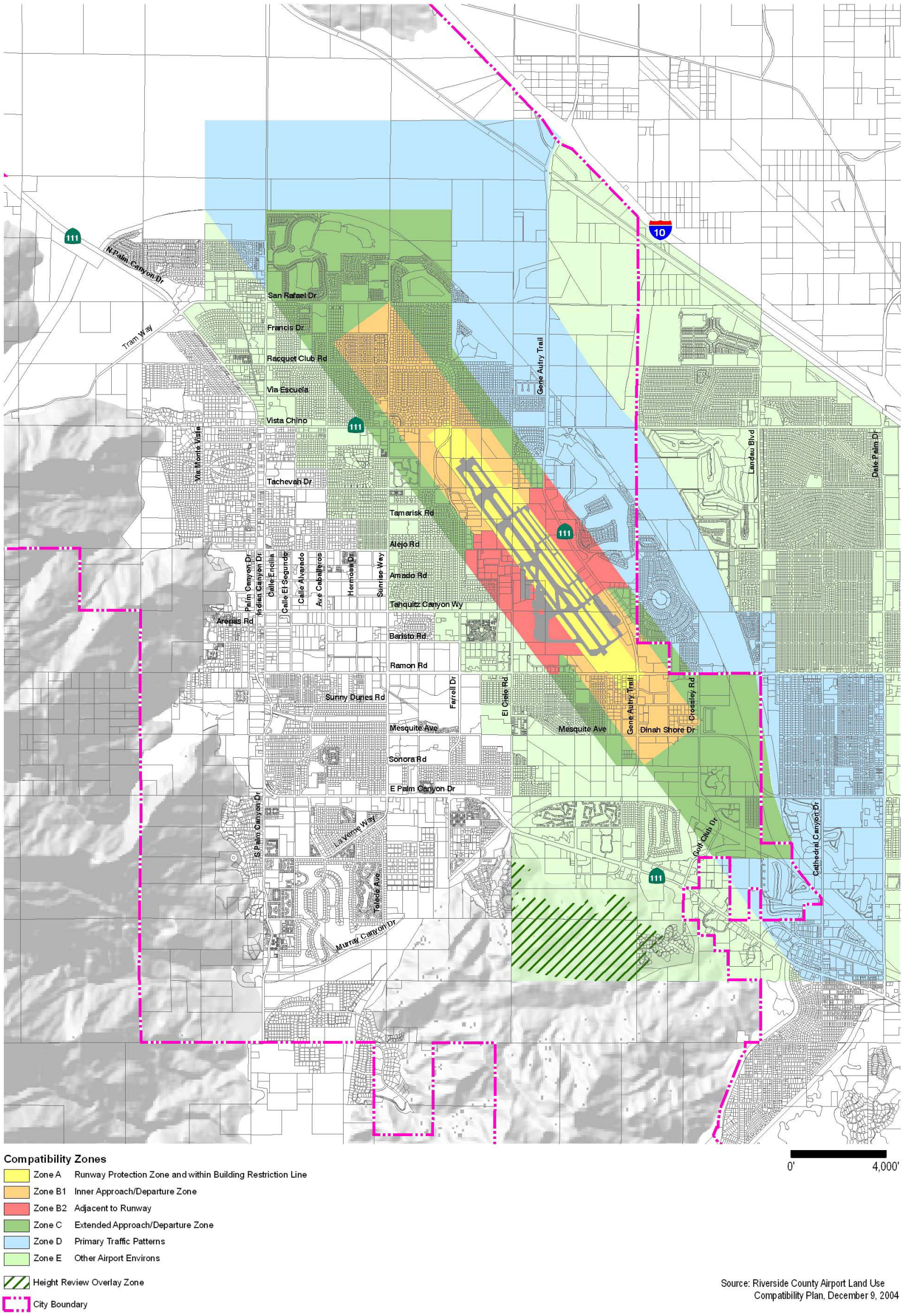
Law Enforcement and Crime Prevention

The Palm Springs Police Department offers response service, criminal investigation, traffic enforcement, and preventive patrol for the City. Although many private, gated communities have internal security for their residents, the Police Department still provides all law enforcement services .

The Police Department's two divisions, Operations and Support Services, employ 100 sworn and 49 civilian personnel. Operations include patrol, jail, and airport operations. Support services include investigation, records, animal control, and communications.

Although National Census Bureau figures indicate that the Palm Springs population is approximately 44,575, the population increases significantly to approximately 75,000 when part-time residents and tourists are included in the winter months. In 2021, the department responded to 75,395 calls for service, an increase of approximately 35,000 calls since 2010.

Figure 6-10 Airport Compatibility Plan



Airport Compatibility Plan

CITY OF PALM SPRINGS GENERAL PLAN

Safety Element

Figure 6-8

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The desired response times for priority one calls (emergencies) and priority two calls (nonemergencies) are 5 minutes and 30 minutes, respectively. The Palm Springs Police Department has mutual-aid agreements with other local law enforcement agencies in the event of a major incident that exceeds the department's resources.

There are currently six patrol beats (geographical patrol areas) serving the city and its sphere of influence in the northern portion of Palm Springs. As the city continues to grow, it will be necessary to expand the existing beat system and possibly add additional satellite field offices. Because of the mountains to the south and west of the city, communications between patrol units and officers using handheld radios can be poor Additional relay towers and communications equipment, particularly in the Palm Hills area and in the City's northern Snow Creek area, would improve communications between patrol units and officers.

The Department's Community Policing Program seeks to enhance involvement with residents of Palm Springs to further promote public safety. The Citizens on Patrol (COP) Program extensively trains volunteers in such areas as traffic control, safe patrol techniques, CPR, and first aid. The Department's Community Policing Program also operates the Citizen's Police Academy, Alarm Diversion School, LGBTQ+ Outreach Committee, and the volunteer-based horseback Mounted Enforcement Unit, which consists of sworn police officers offering their time for high-visibility public events.

Members of the Palm Springs Mounted Enforcement Unit.
(Source: City of Palm Springs Police Department)

A Palm Springs Firefighter responds to a two alarm structure fire in downtown Palm Springs on September 28, 1998.
(Source: City of Palm Springs Fire

Fire Protection and Emergency Services

The Palm Springs Fire Department, established in 1931, provides for fire, paramedic, and emergency services within the city limits and through mutual agreements in the City's sphere of influence. The Fire Department is authorized and directed to enforce the provisions of the Fire Code throughout the city. Its responsibilities also include plan reviews for new construction and additions, coordination with the City for disaster preparedness programs, vegetation management, high fire area inspections, and the Hazardous Materials Business Program.

The Palm Springs Fire Department, with a rating of ***ISO Class 3***, protects 96 square miles of the Palm Springs area, constantly monitors fire hazards in the city, and has ongoing programs for investigation and alleviation of hazardous conditions. Firefighting resources in the Palm Springs area include five fire stations

ISO Rating System

The Insurance Services Office (ISO) evaluates fire protection needs and services in communities across the country. Each community evaluated is rated on a point scale from 1 to 10, with a Class 1 rating representing excellent fire protection services. The City of Palm Springs currently has a Class 3 ISO rating.

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throughout the city so that the response time to any resident is under five minutes, the standard used by the department for maximum first-response time.

In addition, the Palm Springs Fire Department strives to meet the National Fire Protection Association (NFPA) Standard 1710 requirements for response time. NFPA 1710 requires that fire departments establish a six-minute response time for the first-due engine company 90 percent of the time, which includes one minute for dispatch, one minute for "turnout" in the station, and four minutes for travel to the incident. NFPA 1710 also requires an eight-minute response 90 percent of the time for a full-alarm assignment.

Automatic-aid agreements: Obligate the nearest fire company to respond to a fire regardless of the jurisdiction.

Mutual-aid agreements: Obligate fire department resources to respond outside of their district upon request for assistance.

There are a total of 21 on-duty firefighting personnel available during each 24-hour period. The Fire Department's five stations responded to approximately 12,000 calls for service in 2021. Their records indicate that the number of responses has increased every year by approximately 5 to 7 percent. If needed, additional fire assistance can be provided by the following agencies and municipalities with whom Palm Springs has ***automatic-*** and ***mutual-aid agreements***:

- Riverside County Fire Department (RCFD) – mutual aid
- United States Forest Service (USFS) – mutual aid
- California Department of Forestry and Fire Protection (CAL FIRE) – mutual aid
- Bureau of Land Management – mutual aid
- Cathedral City – automatic aid

A Palm Springs paramedic firefighter and a member of the Palm Springs Mounted Police return from a successful canyon rescue.
(Source: City of Palm Springs Fire

The USFS, RCFD, CAL FIRE, and Bureau of Land Management generally respond to fire emergencies outside the city's boundaries and in the sphere of influence. The Palm Springs Fire Department is primarily a structure-oriented protective force—these automatic- and mutual-aid agreements ensure an appropriate response to both urban and wildland fires.

GOAL SA8:

Efficient and effective police and fire protection services to residents, businesses, and visitors of the city.

Policies

SA8.1 Maintain adequate resources to enable the Police Department and Fire Department to meet response-time

standards, keep pace with growth, and provide high levels of service.

SA8.2 Maintain a well-trained, well-equipped police force to meet changing needs and conditions by continually updating and revising public safety techniques and providing for effective evaluation and training of personnel.

SA8.3 Combat crime and increase public safety through community education programs, including active involvement in the Neighborhood Watch Program, and coordinate crime prevention programs at local schools and other meeting locations.

SA8.4 Maintain adequate fire training facilities, equipment, and programs for firefighting and inspection personnel and educational programs for the general public, including fire safety and prevention and emergency medical information.

SA8.5 Maintain and/or upgrade water facilities to ensure adequate capacity to respond to fire hazards.

SA8.6 Require that all buildings subject to City jurisdiction adhere to fire safety codes.

SA8.7 Continue uniform reporting of all fire emergency data, including type and cause of fire alarm, response time, and damage/injury data.

SA8.8 Promote public education regarding fire safety to address issues such as storage of flammable material and other fire hazards.

SA8.9 Continue to regulate and enforce the installation of fire protection water system standards for all new construction projects built within the city. Standards shall include the installation of fire hydrants providing adequate fire flow, fire sprinkler systems, and wet and dry on-site standpipe systems.

SA8.10 Ensure adequate firefighting resources are available to meet the demands of new development, including the construction of midrise structures, by ensuring that:

- Fire-flow engine requirements are consistent with Insurance Service Office (ISO) recommendations.

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- The heights of truck ladders and other equipment are sufficient to protect multiple types of structures.
- Fire stations have adequate capacity and resources to keep pace with growth and are outside of hazard-prone areas.

SA8.11 Use percentage of completion goals as the standard for the distribution and concentration of fire crews throughout the city, as recommended in the Standards for Response Cover Deployment Analysis for the City of Palm Springs Fire Department.

CLIMATE CHANGE RESILIENCE

In Palm Springs, climate change hazards include air quality, drought, extreme heat and warm nights, flooding, human health hazards, landslides, severe storms, and wildfires. This section provides background information, goals, and policies on the climate change not discussed previously in the Safety Element. Appendix X provides additional details about climate change hazards and the vulnerable populations and community assets in Palm Springs.

Air Quality

The dominant sources of air pollution in Palm Springs are ozone pollution from vehicle exhaust and agricultural soils, fine particulate matter and dust from the Salton Sea, and smoke from wildfires in the region. Higher future temperatures will likely increase the production of ground-level ozone, especially in desert cities like Palm Springs, which already experience high levels of this pollutant. Ground-level ozone is associated with a variety of negative health outcomes, including reduced lung function, pneumonia, asthma, cardiovascular diseases, and premature death. As more frequent and severe drought and extreme heat occur in the region, the playa on the Salton Sea is expected to dry, increasing dust production and creating toxic airborne emissions in the region. Smoke from wildfires in the region can also increase air pollution levels and create a significant health risk in the region.

Drought

A drought occurs when conditions are drier than normal for an extended period, making less water available for people and ecosystems. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically, affecting different sectors in different ways and with varying intensities. Adequate water is the most critical issue for commercial and domestic use. As the population in the city continues to grow, so will the demand for water.

Drought is a recurring pattern in California's climate. The State recently experienced the 5-year drought event from 2012 to 2016. Other notable historic droughts in California include 2007 to 2009, 1987 to 1992, 1976 to 1977, and off-and-on dry conditions spanning more than a decade in the 1920s and 1930s.

Source: California Department of Water Resources. N.d. https://water.ca.gov/water-

Based on historical information, the occurrence of drought in California, including the Coachella Valley, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The impacts from drought include reduction in water supply and water quality.

Palm Springs receives water from the Coachella Valley Water District, Desert Water Agency, and Mission Springs Water District through groundwater, purchased water, and recycled water sources. Based on the *2018 Coachella Valley Integrated Regional Water Management Plan*, the Coachella Valley obtains most of its water from the Colorado River, with small amounts from groundwater and recycled water sources. The water agencies have State Water Project allocations, but due to infrastructure limitations, these allocations are exchanged as part of an agreement with the Metropolitan Water District of Southern California for Colorado River water. The Colorado River experiences a reduction in water supply during drought conditions. This can cause water shortages and heavier reliance on groundwater supplies to meet the needs of Palm Springs residents and businesses. Each water district and agency providing water to Palm Springs has a Water Shortage Contingency Plan with specific demand reduction actions to conserve water and ensure reliable supplies. The price of water could, however, increase through drought rate surcharges, increasing the economic instability of low-income residents.

Extreme Heat and Warm Nights

While there is no universal definition of extreme heat, California guidance documents define extreme heat as temperatures that are hotter than 98 percent of the historical high temperatures for the area, as measured between April and October of 1961 to 1990. Days that reach this level are called extreme heat days. In Palm Springs, an extreme heat day occurs when temperatures reach above 107.1 degrees Fahrenheit citywide. However, this threshold is approximately 113 to 115 degrees Fahrenheit in the more urbanized city center. According to Cal-Adapt, the number of extreme heat days in Palm Springs is projected to increase from a historic annual average of 4 extreme heat days per year to an average of 28 extreme heat days per year by midcentury and an average of 50 extreme heat days per year by the end of the century.

Extreme heat can also occur in the form of warmer nights when temperatures do not cool enough overnight to provide relief from the heat. In Palm Springs, a warm night occurs when the temperature remains above 74.2 degrees Fahrenheit citywide. Similar to extreme heat, this threshold would be higher in the more urbanized city center of Palm Springs. The number of warm nights in Palm Springs is projected to increase from a historical annual average of 4 warm nights per year to an average of 32 warm nights per year by midcentury and an average of 64 warm nights per year by the end of the century.

Although Palm Springs is accustomed to warmer temperatures, prolonged extreme heat and warm nights can cause heat-related illnesses, such as heat cramps, heat exhaustion, and heat stroke, in addition to exacerbating respiratory and cardiovascular conditions. Some homes in Palm Springs may lack central air conditioning, and as a result people living in these homes may be more susceptible to harm from extreme heat events. If homes have air conditioning, residents may find increased use cost prohibitive, especially for older or less efficient systems. Indirectly, extreme heat puts more stress on power lines, causing them to run less efficiently. The heat also causes more demand for electricity (usually to run air conditioning units), and in combination with the stress on the power lines, may lead to brownouts and blackouts.

Human Health Hazards

There are several diseases, such as hantavirus pulmonary syndrome, Lyme disease, West Nile virus, and influenza, that are linked to climate change and can be debilitating or fatal for some of the population. Pests such as mice, rats, ticks, and mosquitos carry these diseases. Climate change can increase the rates of infections because many of the animals that carry diseases are more active during warmer weather, and their populations may expand in size due to higher levels of rainfall during storm events and stagnant water after flooding, increasing the time for disease transmittal. Some diseases and illnesses have the potential to become epidemics or pandemics if they spread within communities, regions, or over multiple countries. Epidemics and pandemics, such as the COVID-19 pandemic, can worsen existing health conditions as well as cause economic disruptions in the city and region. Mental health and stress-related disorders also increase following natural disasters such as flooding or severe weather events.

Severe Storms

Severe weather can include high winds, sandstorms, hail, and lightning, which are usually caused by intense storm systems, although high winds and sandstorms can occur without a storm, as discussed above in the Geologic Hazards section. While the connection between climate change and severe storms is not as well established as other hazards, new evidence suggests that these forms of severe weather may occur more often than in the past due to climate change.

Severe winds, such as the Santa Ana winds, tend to be most frequent during October to April and can have average speeds of 40 miles per hour. These winds can destroy buildings, knock over trees, damage power lines and electrical equipment, and fan small sparks into large wildfires in the region. These winds can also pick up dust and other particulate matter from the desert or dry lakebed of the Salton Sea, causing sandstorms that lower visibility and cause toxic particulate matter to get into buildings. In severe instances, roadways can be blocked and other infrastructure damaged by a sandstorm. Severe storms can also bring heavy rainfall, which can lead to flash floods and ponding in areas of the city not protected by a levee. Though less common in the city, hail and lightning can damage the buildings and infrastructure supporting economic sectors and key services.

Key Population Vulnerabilities

Climate change hazards that create the most vulnerabilities in Palm Springs include wildfire, extreme heat, and air quality. The most vulnerable populations include households with financial instability such as households in poverty; persons that spend an extended amount of time outdoors such as children and outdoor workers; persons with existing health conditions or limited mobility such as seniors or persons with chronic illnesses; and persons with language barriers and citizenship uncertainty.

- Persons with financial instability are more likely to live in older homes with poor or inefficient insulation, less structural stability, or lack of efficient or reliable air conditioning. These conditions can increase exposure to unsafe living conditions due to mold and mildew damage from flooding, high indoor air temperatures from extreme heat and warm nights, and poor indoor air quality from air pollution and severe weather.
- Persons that spend an extended amount of time outdoors could be directly exposed to poor air quality, extreme heat, human health hazards, and smoke from wildfires, causing illnesses or economic hardship.
- Persons with existing health conditions or limited mobility may have difficulty preparing for or recovering from hazards, especially if evacuations are needed.
- Persons with language barriers and citizenship uncertainty are more likely to live in less resilient structures and may be hesitant to seek help or may not qualify for financial assistance programs that can help them prepare and recover from a disaster.

Other vulnerable populations include persons experiencing homelessness, as they may not have access or the ability to travel to safe shelters to hazardous events, in addition to persons living on single access roads, which could be blocked by landslides or wildfires preventing this population from evacuating.

Appendix X provides a more detailed description on the population vulnerabilities in Palm Springs due to climate change hazards.

GOAL SA9:

A community resilient to climate-change-related hazards.

Policies

SA9.1 Elevate extreme heat as an important hazard of concern in Palm Springs and respond to extreme temperatures.

SA9.2 Coordinate with SunLine Transit Agency and regional transit providers to identify alternate routes and stops if normal infrastructure is damaged or closed as a result of severe storms or flooding.

SA9.3 Coordinate with Southern California Edison and Desert Clean Energy to incentivize residential and on-site solar systems, especially when paired with battery storage to provide a resilient energy supply for homes.

SA9.4 Coordinate with County of Riverside Public Health to ensure emergency and public health services can meet the needs of the population during extreme heat, poor air quality, and human health hazard events.

SA9.5 Increase the resiliency of City-owned structures to severe storm events and support homeowners and business owners to increase the resilience of their buildings and properties through retrofits, weatherization, and other improvements.

SA9.6 Collaborate with Southern California Edison to underground electrical transmission infrastructure throughout the city, prioritizing high voltage transmission lines and areas in Very High Fire Hazard Severity Zones and the Wildland Urban Interface.

SA9.7 Promote and expand the use of drought-tolerant green infrastructure, including street trees and landscaped areas, as part of cooling strategies in public and private spaces.

SA9.8 Prepare for more frequent and severe drought events by working with regional water providers to implement extensive water conservation measures and ensure sustainable water supplies.

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SA9.9 Encourage businesses that have outdoor workers to allow for shifting in work hours to earlier in the day from May through September to reduce heat-related illnesses among outdoor workers on extreme heat days.

SA9.10 Prepare for more frequent and severe drought events by working with Desert Water Agency and other regional water providers to implement extensive water conservation measures and ensure sustainable water supplies.

SA9.11 Encourage new developments and existing property owners to incorporate sustainable, energy-efficient, and environmentally regenerative features into their facilities, landscapes, and structures to reduce energy demands and improve on-site resilience. Support financing efforts to increase the communities funding of these features.

SA9.12 Where feasible, encourage the use or restoration of existing natural features and ecosystem processes when considering alternatives for the conservation, preservation, or sustainable management of open space. This may include, but is not limited to, aquatic or terrestrial vegetated open space, systems and practices that use or mimic natural processes, and other engineered systems to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife.

SA9.13 Collaborate with Southern California Edison, Desert Clean Energy, and organizations such as the Community Access Center to ensure that those who depend on electricity supply for medical devices and refrigerating medication have backup energy supplies during extreme heat and extreme wind events.

SA9.14 Look for opportunities to ensure that workers in outdoor industries have the training and resources to be adequately protected from environmental hazards, including extreme heat, poor air quality, pests, and diseases.

SA9.15 Collaborate with Riverside County Department of Public Health and healthcare providers to prepare for disasters and health emergencies, minimizing disruptions to medical services and facilities in Palm Springs.

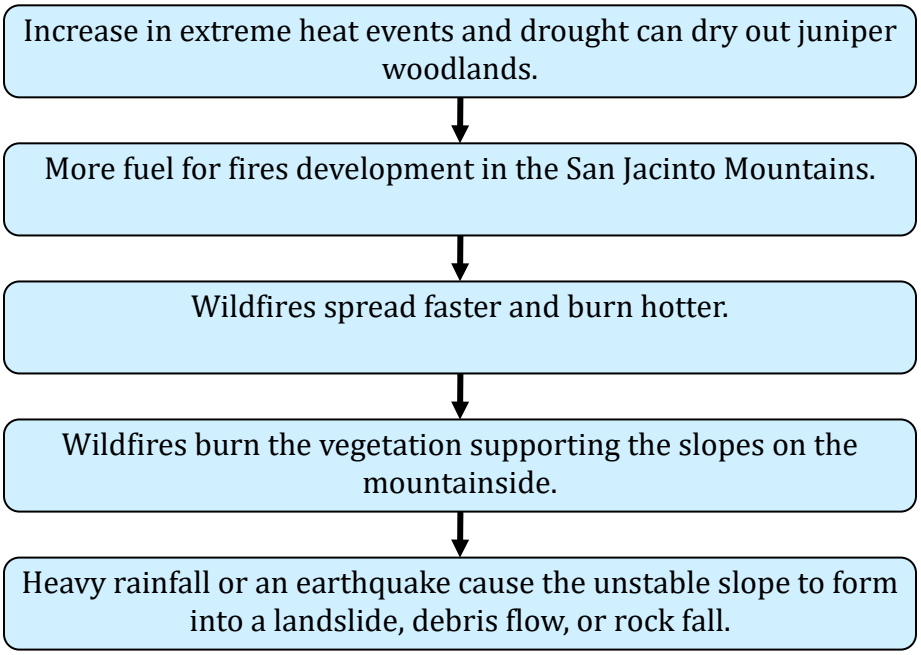
MULTIPLE NATURAL HAZARDS

Due to the location in an earthquake prone region, floodplains, wildfire prone area, and steep topography, Palm Springs is in an area that can experience multiple, simultaneous natural hazards. These can also be called ***compounding hazards*** or ***cascading hazards***. Compounding hazards could include a flood event that is followed by earthquake, which are unrelated events that could compound to increase liquefaction in soils near floodplains. Cascading hazards, on the other hand, occur one after the other. For example, an increase in extreme heat events and drought can dry out juniper woodlands in the San Jacinto Mountains, leading to more fuel for wildfire, which can lead to a faster moving and higher burning wildfire. The burn scar of that wildfire could then experience heavy rainfall, which could lead to a landslide, rockfall, or debris flow. This cascading of hazards is shown on Figure 6-11. All of these hazards are discussed separately above, but when combined, these hazards can cause more devastating consequences for Palm Springs residents, visitors, and businesses.

Compounding Hazards: Events where more than one hazard occurs at the same time and interact to cause more destructive consequences.

Cascading Hazards: Extreme events that link together hazards over days, weeks, or months, resulting in multiplied effects that cause secondary and sometimes tertiary damage, exceeding the damage of the initial hazard event.

Figure 6-11. Example of Cascading Hazards



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GOAL SA10:

A community prepared for multiple natural hazards.

Policies

SA10.1 Require that proposed essential, sensitive, and high-occupancy facilities undergo careful seismic, geologic, flooding, and fire review prior to any approvals and that effective post-disaster functioning be a primary concern in the siting, design, and construction standards for essential facilities.

SA10.2 Minimize the risk to life and property through the identification of potentially hazardous areas, adherence to proper construction design criteria, and provision of hazards information to all residents and business owners.

SA10.3 Where appropriate, designate hazard zones as open space (earthquake fault lines, floodways and floodplains, steep or unstable slopes, areas susceptible to rockfalls and landslides, wildfire prone areas, etc.) and update these areas on the land use map.

SA10.4 Encourage and cooperate with Caltrans to stabilize susceptible slopes and strengthen bridges, elevated roadways, and other structures along state highways that may be subject to failure during major hazardous events, thereby isolating portions of the community from emergency aid and assistance.

SA10.5 Provide protection for roadways and utility lines from all applicable hazard conditions to ensure they remain open for evacuation needs.

SA10.6 Continue to use the Emergency Announcement System to implement hazard warnings and evacuation plans for those portions of the city in flood hazard zones, wildfire- and landslide-prone areas, and seismically active areas that have already been inhabited or developed and for critical facilities such as schools.

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RPC 2(b)(vii)