CITY OF HUNTINGTON PARK GENERAL PLAN

HEALTH AND SAFETY ELEMENT

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GENERAL PLAN ACTIVITY LOG

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	Amended concurrent with adoption of the 6th Cycle Housing Element.	

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1 INTRODUCTION TO THE HEALTH AND SAFETY ELEMENT

SCOPE OF HEALTH AND SAFETY ELEMENT

The Health and Safety Element of the City of Huntington Park General Plan focuses on public safety through prevention and preparedness. The implementation of the programs outlined in this Element will assist in preventing or reducing the potential for injury, damage and disruption resulting from natural or man-made catastrophes. Public safety programs include procedures for the elimination or avoidance of hazards, emergency preparedness, and emergency response. This Element also serves as the framework for emergency preparedness planning that may be undertaken in the future. Finally, the Health and Safety Element outlines the public safety issues that will need to be considered as part of the implementation of land use and development policy provided for in this General Plan.

The Health and Safety Element also establishes specific standards related to public safety. These standards serve as guidelines for future planning and land use decisions. The Health and Safety Element maps the location of known hazards, evacuation routes, and indicates peak water supply requirements, minimum road widths, clearances around structures, and other factors affecting safety procedures.

RELATIONSHIP TO GENERAL PLAN

The Health and Safety Element is consistent with other elements of the General Plan. The information, policies and programs contained in this element are closely related to other General Plan elements. For example, the placement of sensitive land uses that may be subject to various hazards described in this element is regulated by policies contained in the Land Use Element. Evacuation, which is assessed in this element, is mediated by the efficiency of traffic flow determined in part by the Circulation Element. The Health and Safety Element, however, is concerned with the health and welfare of those persons living, working, or visiting the City. The successful implementation of the Health and Safety Element may result in a significant reduction in loss of life and injury. According to the State's planning laws, a Health and Safety Element is required for the protection of the community from any unreasonable risks associated with the effect of seismically induced surface rupture, ground-shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mud slides and landslides, subsidence, and other geologic hazards known to the legislative body; flooding and wild land and urban fires, and hazards associated with climate change. The Health and Safety Element shall include the mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peak load water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

The City of Huntington Park Health and Safety Element fulfills the aforementioned requirements. The Health and Safety Element considers a wide range of natural and man-made hazards that could affect the City in the future . As stated previously, this Health and Safety Element emphasizes the importance of emergency preparedness in reducing the potential for loss of life, injury, and property damage. An additional objective of the Health and Safety Element is to implement programs that will help to avoid the creation of hazardous conditions. Finally, the Health and Safety Element underscores the City's commitment to provide the material and human resources needed to deal with future emergencies.

2 PLANNING BACKGROUND

OVERVIEW OF SEISMIC HAZARDS

The City of Huntington Park is located on the northeastern portion of the Los Angeles Basin. This basin is an alluvial plain bounded on the north by the Santa Monica Mountains, on the northeast by Repetto Hills, and Puente Hills, on the south by the Santa Ana Mountains and San Joaquin Hills and on the east by the Pacific Ocean. The severity of earthquakes is normally classified according to their magnitude, or intensity. Because the amount of destruction generally decreases with increasing distance from the epicenter, earthquakes are assigned several intensities, but only one magnitude. The destructiveness of an earthquake at a particular location is commonly reported using the Richter scale (magnitude) or Mercalli scale (intensity).

The Modified Mercalli Scale (MM) employs a subjective classification system based on observations of damage caused by past earthquakes. The scale has 12 levels of damage, the higher the number, the greater the damage. For example, the City of Huntington Park is predicted to experience ground-shaking with a MM intensity of 6.0 to 6.5 during a Magnitude 8.3 along the San Andreas Fault with a maximum MM intensity 6.5 to 7.0. The intensity of seismic ground-shaking at any given location is a function of several factors, but primarily the magnitude of the earthquake, the distance from the epicenter to the planning area, and the local geologic and topographic conditions. The recent Elysian Park and Northridge earthquakes did demonstrate, however, that the ground intensities from these previously unknown blind thrust faults could generate significant damage to both low-rise and high-rise structures which were previously considered to be capable of withstanding the effects of strong ground motion.

SEISMIC FAULTS IN THE AREA

The State of California, under the guidelines of the Alquist-Priolo Special Studies Act, classifies earthquake faults according to the following criteria:

- Active faults exhibit proven displacement of the ground surface within the last 11,000 years (Holocene);
- Potentially active faults exhibit evidence of movement within the last 750,000 to two million years.
- Inactive faults have not moved in the last 11,000 years, as determined from direct geologic evidence, and are presumed to be inactive.

The State definition of an active fault is designed to gauge the surface rupture potential of a fault, and is used to prevent development from being located directly on the trace of an active fault. In general, potentially active faults are, relative to active

faults, less likely to be the origin of a damaging earthquake. In reality, however, there is a gradation of seismic risk posed by potentially active and active faults.

There are no active or potentially active earthquake faults known to traverse the City of Huntington Park, thus, no ground rupture hazards are expected in the City. The City is, however, located within a seismically active region and is subject to ground-shaking hazards associated with earthquake events in the region. Seismicity in the Los Angeles area historically has been defined by earthquake events along the Newport-Inglewood, San Fernando, San Jacinto, and San Andreas faults. Other faults of concern in the area include the Whittier fault, the Elysian Park Thrust, and the Santa Monica-Hollywood fault, as shown in Figure 1.

The major faults within the Southern California region, their distance and direction relative to the City of Huntington Park, the maximum credible earthquake postulated for each fault, and the maximum probable earthquake for the faults identified in Table 1. The maximum credible earthquake is the largest magnitude event that appears capable of occurring under the presently known tectonic framework. The maximum probable earthquake is the maximum earthquake likely to occur during a 100-year interval.

The major faults in the Southern California region are described below.

- The **Newport-Inglewood Fault Zone** is located approximately 9.0 miles west of the City. The 1933 Long Beach Earthquake occurred on the Newport-Inglewood fault. A maximum credible earthquake of Magnitude 6.8 on the Newport-Inglewood fault has the potential of generating horizontal peak ground accelerations of about 0.2 to 0.3 g in the area. Ground-shaking could last approximately 22 seconds, with seismic Mercalli intensity values of VII to VIII. This type of earthquake would be particularly damaging to older low-rise structures located within the City.
- The **Palos Verdes Hills Fault** is located 20 miles southwest of the City and is considered to be an active fault based on late Pleistocene and Holocene age displacements that have been interpreted along offshore segments of the fault in the San Pedro shelf. The fault is considered to be capable of generating a maximum credible earthquake of Magnitude 7.0 that would cause seismic intensities in the IX to X range. The Palos Verdes fault extends for a distance of approximately 60 miles from San Pedro Bay to the Santa Monica Bay. The Palos Verdes fault could result in greater damage than that anticipated from an earthquake on the San Andreas Fault due to its proximity to the City.
- The **Sierra Madre Fault Zone** is located approximately 15 miles northeast of the City at the base of the San Gabriel Mountains and forms a prominent 50-mile long east-west structural zone on the south side of the San Gabriel Mountains. The Sierra Madre fault system was responsible for the uplift of the San Gabriel Mountains by faulting in response to tectonic compression.

Figure 1 Regional Fault Map

Table 1 Major Faults

Fault	Distance	Maximum Magnitude
Whittier	9 miles E	7.00
Santa Monica-Hollywood	10 miles NW	7.00
Raymond Hill	10 miles NE	6.50
Sierra Madre	15 miles NE	6.50
San Fernando	25 miles NW	6.50
Elysian Park	5 miles N	7.60
San Jacinto	44 miles NE	7.50
Palos Verdes	20 miles SW	7.00
San Andreas	37 miles NE	8.25
Malibu Coast	22 miles W	7.00
Source: United States Geological Survey		

The **Whittier-Elsinore Fault Zone** is located along the southern base of the Puente Hills approximately 9.0 miles east of the City of Huntington Park. This northwest-trending fault extends from the Whittier Narrows area continuing southeast across the Santa Ana River, past Lake Elsinore, into western Imperial County and then continuing on into Mexico. This fault is expected to be capable of generating a Magnitude 6.6 earthquake.

The **Santa Monica-Malibu Coast Fault System** is an east-west trending fault system located along the southern margin of the western Santa Monica Mountains and into Santa Monica Bay. The nearest fault trace is located approximately 22 miles west of the City. Although there has been very little seismic activity along this fault system, the Malibu Coast fault segment has been characterized as active based on displaced soils. This displacement was estimated to have occurred about 5,000 years ago.

The **San Andreas Fault Zone** is located approximately 37 miles to the north and northeast of the City at its nearest point. This fault zone extends from the Gulf of California continuing northward to the Cape Mendocino area where it continues northward along the ocean floor. The total length of the San Andreas Fault Zone is approximately 750 miles. This fault has been active during historic times including the 1906 (estimated Magnitude 8.0) earthquake in San Francisco and the 1857 Fort Tejon earthquake (estimated Magnitude 7.9) where at least 250 miles of surface rupture occurred. The length of the fault and its active seismic history indicates that it has a very high potential for large-scale movement in the near future (Magnitude 8.0), and should be considered in land use planning for most areas of California.

The **San Jacinto Fault Zone** is located approximately 44 miles northeast of the City and is part of the San Andreas Fault System. The two fault strands separate near the San Gabriel Mountains, where the San Jacinto fault extends southeastward to form the southwestern boundary of the San Jacinto Mountains and the San Timoteo Badlands. This fault is thought capable of generating a maximum credible earthquake of magnitude 7.0. Strong ground-shaking from this earthquake would last about 25 seconds, with MM intensity values in the VIII-IX range.

The **Elysian Park Blind Thrust Fault** is exposed for approximately two miles at Elysian Park but is not exposed over the rest of its trace toward the east. (Blind thrust faults are low-angle or low-lying faults occurring generally five to 15 kilometers below the ground surface which have no surface manifestation). This fault underlies the urbanized portion of the Los Angeles Basin, including downtown Los Angeles, as inferred from geophysical and geomorphologic evidence and the clustering of deep earthquakes in the region. The Elysian Blind Thrust is located approximately five miles from the City of Huntington Park at its nearest point. The Elysian Park Fault was the source of the magnitude 5.9 earthquake near Whittier in 1987. This fault is thought to be capable of generating earthquakes of magnitude 7.2 to 7.6 and would result in intense ground-shaking in the entire Los Angeles basin.

The **Torrance-Wilmington Fault** is a newly postulated, blind thrust fault and fold system located under the Palos Verdes Peninsula. Although the location of the Torrance-Wilmington Fault System is not well defined, the fault and fold belt have been divided into several segments. It is estimated that if one of the segments ruptures, an earthquake of Magnitude 5 to 7.5, would occur. If two or more segments rupture simultaneously, an earthquake of a magnitude greater than 7.8 could occur.

The four largest recent earthquakes that have caused major damage in the Los Angeles basin include the 1933 Long Beach (Magnitude 6.3), 1971 San Fernando (Magnitude 6.4), the 1987 Whittier Narrows (Magnitude 5.9), and the 1994 Northridge (Magnitude 6.7) earthquakes. The 1933 Long Beach earthquake occurred on the southern segment of the Newport-Inglewood fault, from Newport Beach to Signal Hill. The 1971 San Fernando earthquake occurred along the San Fernando segment of the Sierra Madre fault zone. The Whittier Narrows earthquake occurred on the Elysian thrust fault in 1987. Finally, the most recent major earthquake, the Northridge earthquake, occurred on the Oakridge fault in the San Fernando Valley in January 1994. Most injuries and property damage from a major earthquake impacting the City will be caused by strong ground motion, especially structural damage to buildings. The developed areas of Huntington Park consist mostly of low density and medium density residential zones. Less extensive areas are devoted to low-rise commercial development. Low-rise buildings (less than three stories) common in the City are more likely to be damaged by a near-field earthquake, such as one occurring on the Newport-Inglewood fault or the Hollywood fault.

The wood-frame construction used in the residential and some commercial development in the City generally performs well during earthquakes. These buildings may experience significant structural and nonstructural damage, but rarely collapse. However, a trend in wood-frame construction in recent years, in particular in housing construction, has been the split level and irregular floor plans. Earthquake intensities of VIII in the Mercalli Scale may cause torsional racking of the foundation and wall elements of irregular structures. Single-family residences built before the 1952 Building Code was implemented are more likely to slip off their foundations as a result of strong ground motion associated with nearby earthquakes. Mobile homes are also susceptible to slipping off their foundation.

Critical facilities are structures and parts of a community's development that must remain operational after an earthquake. In addition, those facilities that pose unacceptable risks to public safety if severely damaged are also of critical concern. Essential facilities such as medical centers, fire and police stations, emergency operations centers, schools, and communication centers are also considered to be critical facilities. High-occupancy facilities have the potential of resulting in a large number of casualties or crowd control problems. This category includes the Civic Center, churches, and large multi-family residential complexes. Dependent care facilities that house populations with special evacuation considerations, such as pre-schools and schools, group care homes, and nursing and convalescent homes are also considered critical facilities.

The State, with the passage of the Garrison Act of 1969, has jurisdictional responsibility to ensure that public schools are adequately constructed to seismic standards. The Los Angeles County Fire Department is responsible for inspections of deficient electrical, plumbing, mechanical, or fire safety fixtures in high-occupancy residential and commercial facilities.

The California Department of Conservation, Oil, Gas, and Geothermal Division has prepared Planning Scenarios for a major earthquake on the Newport-Inglewood and San Andreas faults to assist in emergency response and recovery efforts. These reports show the City of Huntington Park as having seismic intensities of eight and above, and liquefaction hazards. The Long Beach Freeway and other infrastructure and utility lines in the area would be subject to localized damage.

LIQUEFACTION RISK

Liquefaction may occur when loose, unconsolidated, saturated fine-to-medium-grained sandy soils are subjected to ground vibrations during an earthquake. Liquefaction occurs in areas where the ground water table is within 50 feet of the ground surface when the Mercalli scale intensities are VII or greater. When these sediments are shaken, a sudden increase in pore water pressure causes the soils to lose strength and behave as liquid. Excess water pressure is vented upward through fissures and cracks in the soil causing water-soil slurry to bubble onto the ground surface. These are called sand boils, sand blows, or sand volcanoes. Liquefaction-related effects include loss of bearing strength, ground oscillations, lateral spreading, and flow failures or slumping. Structures constructed on soils that liquefy may sink or topple over as the soil loses its bearing strength.

A study of earthquake hazards by the United States Geological Survey (USGS) indicates that a majority of the City is subject to liquefaction, although the portion located north of Gage Avenue, west of Pacific Boulevard, and east of Wilmington Avenue is not at risk for liquefaction (refer to Figure 2). Areas containing shallow groundwater within 30 feet or less of the ground surface are susceptible to liquefaction hazards during seismic shaking.

Figure 2 Liquefaction Map

FLOODING AND INUNDATION HAZARDS

The City is located approximately 14 miles to the north of the Pacific Ocean and will not be exposed to the effects of a tsunami. In addition, there are no surface bodies of water located in the city; therefore, the risk of being impacted by a seiche is non-existent. A seiche occurs when two waves traveling in opposite directions collide, creating a larger standing wave.

A review of the Federal Emergency Management Agency (FEMA) flood insurance map obtained from the FEMA Flood Map Service Center, indicated that the entire city is located in Zone X an "Area of Minimal Flood Hazard"[1]. This flood zone represents areas outside the 500-year flood plain. Thus, properties located in Zone X are also not located within a 100-year flood plain.

[1] FEMA Flood Map Service Center. https://msc.fema.gov/portal/search?AddressQuery=Huntington%20Park#searchresultsanchor

The City of Huntington Park is located within the inundation paths of the Hansen and Sepulveda Dams. Large areas downstream of the Hansen and Sepulveda Dams, including the City of Huntington Park, are at risk of inundation in the event of dam failure. The Hansen and Sepulveda Dams are operated by the Army Corps of Engineers and were constructed primarily for flood control. The flood hazards associated with dam failure will affect most areas south of the dams.

The **Hansen Dam** is located on the northern edge of the San Fernando Valley, approximately four miles west of Sunland. The inundation area of the Hansen Dam include areas along the Tujunga Creek and several communities in the valley, the City of Los Angeles, cities in south central Los Angeles, and areas along the Los Angeles and San Gabriel Rivers. The City of Huntington Park is located approximately 25 miles south of the dam but dam failure will affect the entire City of Huntington Park. Flood waters will arrive 17.75 hours after failure with a maximum depth of one foot approximately 21 hours after failure.

The **Sepulveda Dam** is located on the Los Angeles River near the intersection of the Ventura and San Diego Freeways near the City of Van Nuys. The probable maximum flood from the Sepulveda Dam is expected to last four days with a total volume of 163,200 acre-feet. The flood will affect areas along the Los Angeles River, and the cities of Los Angeles, Huntington Park, South Gate, Compton, Lynwood, Maywood, Huntington Park, Huntington Park, and Huntington Park Gardens. The flood waters are anticipated to reach the City approximately ten hours after failure. A maximum flood elevation of two feet is expected approximately 12 hours after failure.

FIRE HAZARDS

There are no open grass areas in or around the City which present brush fire or wildfire hazards in the City of Huntington Park. The major risk involves structural fires associated with older buildings in the City which may not be in compliance with the more recent and stringent fire safety codes and regulations.

Furthermore, industrial uses may also be considered to have a greater risk for fire due to the higher potential for use of flammable, explosive, and hazardous materials. The industrial uses in Huntington Park are located within the western and northern portions of the City.

HAZARDOUS MATERIALS

All businesses that handle hazardous materials are required by various Federal, State, and local agencies to submit a business plan to their local administering agency (the reportable quantities are 50 or more gallons of a liquid, 500 pounds or more or a solid, or 200 cubic feet or more of a gas at standard temperature and pressure; quantities for acutely hazardous materials vary according to the substance).

Every hazardous material handler is required to submit a business plan and an inventory of hazardous substances and acutely hazardous materials to the Huntington

Park Police Department and the County Fire Department on a yearly basis. If the hazardous materials inventory of a business should change, a revised business plan must be submitted. Hazardous material users and generators in the City include gasoline stations, auto repairs shops, printers and photo labs, clinics, dry cleaners, schools, fire stations, and a variety of other commercial and industrial land uses. See the Environmental Justice Element for more detailed information about hazardous waste in Huntington Park.

The State of California defines a hazardous material as a substance that is toxic, ignitable or flammable, or reactive and/or corrosive. An extremely hazardous material is defined as a substance that shows high acute or chronic toxicity, carcinogenicity, bio-accumulative properties, persistence in the environment, or is water-reactive (California Code of Regulations, Title 22).

The primary concern associated with the release of a hazardous material relates to the public health risks of exposure. Toxic gases are a primary concern, since a gaseous toxic plume is more difficult to contain than a solid or liquid spill and a gas can impact a larger segment of the population in a shorter time span. Releases of hazardous materials may also occur during a natural disaster, such as during an earthquake. Improperly stored containers of hazardous substances may overturn or break, pipelines may rupture, and storage tanks may fail. Containers may also explode when subjected to high temperatures, such as those generated by a fire. If two or more chemicals which are reactive when combined come in contact as a result of a spill, the hazard may be compounded.

The Uniform Fire Code includes criteria designed to minimize the risk of an accident. These guidelines are to be followed when storing, using, or transporting hazardous materials, and include secondary containment of substances, segregation of chemicals to reduce reactivity during a release, sprinkler and alarm systems, monitoring, venting and auto shutoff equipment, and treatment requirements for toxic gas releases.

EMERGENCY RESPONSE

The City of Huntington Park contracts its fire services through the Los Angeles County Fire Department. The Los Angeles County Fire Department operates two fire stations in the City: Fire Station 164, located at 6301 South Santa Fe Avenue, serves as the area's battalion headquarters (Huntington Park is serviced by Los Angeles County Fire Department-Battalion 13); and Fire Station 165, located at 3255 Saturn Avenue.

HEALTH CARE SERVICES AND EMERGENCY SHELTERS

Primary health care is provided by the St. Francis Medical Center in Lynwood; Downey Community Hospital; U.S.C. Medical Center and the Los Angeles Community Hospital in East Los Angeles; Martin Luther King, Jr. Hospital in Los Angeles; Rio Hondo Memorial Hospital in Downey; Rancho Los Amigos Medical Center in Downey; and Community Hospital of Huntington Park. A number of

structures have been designated as emergency shelters by the Emergency Preparedness Commission for the cities in Los Angeles County.

FIRE PROTECTION STANDARDS – FIRE FLOW

To ensure emergency water supply throughout the City, new construction is required to meet specific fire flow standards. Fire flows for individual structures are calculated according to size of the structure (floor area), type of construction (wood, non-combustible, fire-resistance), building height, presence of sprinkler systems, distance between buildings, and type of use. The Los Angeles County Fire Department's Fire Prevention Bureau determines the minimum flows for new construction based on building plans and developers are responsible for providing adequate fire flows. This ensures that hydrant capacity is available to meet fire emergency needs of all developments. The City of Huntington Park follows the County Fire Department Fire Code standards for fire flows and emergency access roads. Fire flows of 1,000 gallons per minute (gpm) to 5,000 gpm at 20 pounds per square inch (psi) of residual pressure for a duration of two to five hours is needed at residential and commercial uses, with hydrants every 300 to 600 feet, based on the type of occupancy. The water system must be capable of supplying adequate quantities of water for firefighting purposes, in addition to the daily supply for domestic demand in the area. Adequate reservoir capacity is determined by the availability of water for peak day supply plus fire flow requirements. Generally, peak day supply is twice the average day demand and total fire flow requirements are estimated by the population of the area.

Figure 3 below shows the location of critical facilities, such as fire stations and medical centers, throughout the city.

Figure 3 Critical Facilities

CLIMATE CHANGE HAZARDS

The impacts of climate change on Huntington Park are included in this Health and Safety Element, as mandated by State law. Climate change is driven by the human contribution of certain gases, like carbon dioxide and methane, into the atmosphere. These gases, commonly known as greenhouse gases (GHGs) absorb and re-emit heat that has been discharged from the Earth's surface. This works to trap heat near the Earth's surface, increasing the natural greenhouse effect. GHGs from human activities have been collecting in the atmosphere since the 1800's and are raising global average temperatures. This rise in average temperatures across the globe affects precipitation patterns, temperature, and ocean water levels, temperatures, and chemistry. The Intergovernmental Panel on Climate Change, a United Nations subgroup responsible for global advancement and communication of climate change science has concluded that global climate change will impart adverse effects on the Earth's natural and built systems, resources, and populations.

The intergovernmental Panel on Climate Change has established several GHG emissions scenarios used to describe possible future GHG emissions and associated warming. These emissions scenarios are referred to as Representative Concentration Pathways (RCPs). Two of these RCPs are commonly used to compare possible futures and were selected for the City's 2023 Climate Vulnerability Assessment, consistent with guidance from the California Government Office of Emergency Services (Cal OES) California Adaptation Planning Guide. The two scenarios used for the climate vulnerability assessment are RCP 4.5 which represents a "medium emissions "scenario, and RCP 8.5 which represents a "high emissions" scenario.

The City conducted a Climate Change Vulnerability Assessment (Appendix S-1) consistent with Government Code Section 65302(g) as amended by SB 379, which assesses how the populations and assets in Huntington Park are vulnerable to climate change. According to the vulnerability assessment, the City is most vulnerable to increased extreme heat and worsened air quality. Additionally, climate change is expected to result in Huntington Park experiencing more extended droughts and stronger storms, which may cause more frequent, localized stormwater flooding., Specific impacts on the community and assets of Huntington Park will vary based on exposure, physiological and socio-economic characteristics of the City's populations and resources. The following section includes key findings from the climate vulnerability assessment including overviews of each climate hazard and how it may impact health and safety in Huntington Park. Refer to the climate vulnerability assessment for additional details about the RCPs, climate hazards, and potential climate impacts.

EXTREME HEAT

The number of extreme heat days and warm nights is expected to increase dramatically over the rest of the century.

Extreme heat can cause a wide range of health problems such as rashes, cramps, heat exhaustion, heat stroke, or even death. In Huntington Park, an extreme heat day is defined as any day when the maximum temperature exceeds 96.1°F. Historically, the city experienced an average of two extreme heat days per year. The average number of extreme heat days is expected to increase to a total of 10 (RCP 4.5) to 21 (RCP 8.5) days per year by the end of the century.

Warm nights affect the body's ability to cool down and recover from heat stress during extreme heat periods exacerbating heat-related health problems including, heat exhaustion, dehydration, and cardiovascular stress. In Huntington Park, a warm night is defined as nights when the daily minimum temperature is above a threshold temperature of 70.3°F (CEC 2021). Historically, the city has had an average of five warm nights per year. End-of-century projections range from 25 (RCP 4.5) to 63 (RCP 8.5) additional warm nights annually.

Urban heat island effect compounds the impact of increased temperatures and disproportionately impacts low-income communities and communities of color.

Urban heat island is a term that refers to developed areas that are hotter than the surrounding landscape primarily due to the use of building materials and surfaces that absorb and re-radiate heat (like roofs and pavements), as well as a lack of vegetation, particularly trees. The urban heat island effect causes people in cities to have higher heat exposure than residents in less densely developed areas. Urban heat island will likely compound the impact and risk of extreme heat days and higher average temperatures resulting from climate change. In some locations, the effect could be twice as strong as the impact of global warming.

Within urban landscapes, neighborhoods with more impermeable and dark colored surfaces, and fewer trees, parks, and water features, have greater heat exposure and heat related risk than urban communities with more green space and reflective surfaces. These differences in development patterns typically correspond with income and demographic disparities across the urban environment. Low-income communities and many communities of color across Los Angeles County are the most impacted by the urban heat island effect.

The condition of housing stock can increase heat health risk.

Housing and socio-economic factors can intersect in ways that compound the risks of climate impacts such as extreme heat events. When housing is in short supply and unaffordable this can lead to overcrowding, especially for lower-income communities. Aging, overcrowded, and poorly insulated housing can contribute to risk from heat related illness, which can in turn lead to hospital visits and even increased mortality. If the electricity grid is strained during a heat wave and there are power outages, this can further increase the risk of heat related illnesses if access to adaptations such as air conditioning, fans, and refrigeration are lost. Aging and overcrowded housing, in addition to affordability issues increases risk of heat related health issues in Huntington Park.

All priority populations groupings identified in the climate vulnerability assessment are likely to face impacts from extreme heat and warm nights.

Extreme heat and warm nights can lead to heat related illnesses such as heat stress, heat stroke, and dehydration, which can be life-threatening. In addition, extreme heat conditions can exacerbate asthma, cardiovascular disease, certain disabilities, and other respiratory and cardiovascular conditions leading to increased emergency room visits, hospitalizations, and fatalities.

The populations most impacted by extreme heat include seniors, children, people with chronic health conditions, especially asthma and cardiovascular disease, outdoor workers, and people experiencing homelessness.

AIR QUALITY

Air quality is expected to worsen in Huntington Park due to existing regional characteristics combined with climate driven increases in dust, smog, smoke, and decreases in natural filtrations.

- **Regional characteristics.** The City of Huntington Park is in the South Coast Air Basin. Air quality in this basin is primarily influenced by a wide range of emissions sources – such as dense population centers, heavy vehicular traffic, industry – and weather. The region often has low wind speeds, and together all these conditions can contribute to high-pollution days.
- **Dust.** Increased temperature leads to dry, dusty conditions also associated with drought. Dust particles are considered a type of air pollution, called particulate matter, because they are small enough to be breathed into the lungs where they can cause health issues. Particulate matter can cause increased respiratory disease, lung damage, cancer, reduced visibility, and surface soiling.
- **Smog.** Increases in ambient temperature can lead to higher levels of smog. Depending on the level of exposure, smog can cause various health impacts ranging from mild discomfort to more serious aggravation of existing health conditions. Smog can cause coughing, sore or scratchy throat, difficulty breathing, airway inflammation or damage, and increased susceptibility to lung infection. Exposure to smog can also aggravate lung diseases such as asthma, emphysema, and chronic bronchitis. Higher rates of ground-level smog leads to raised cardiovascular and respiratory morbidity and mortality rates.
- **Fewer Natural Filtrations.** Long dry periods without rain lead to less reliable air quality for the entire region. Moisture in the air can filter pollutants and provide for overall improved conditions. Trees remove gaseous air pollution. Large healthy trees remove more pollution than younger, smaller trees. Rising temperatures could increase mortality for large healthy trees which would reduce the ability for urban vegetation to reduce air pollutants, therefore increasing pollutant exposure to sensitive populations.
- **Wildfire Smoke.** Wildfires have increased throughout the state and are expected to continue to increase. Wildfire smoke can travel many miles beyond the perimeter of the fire, meaning that increased wildfires regionally will lead to increased exposure to wildfire smoke. Wildfire smoke is a mixture of gaseous pollutants, hazardous air pollutants, water vapor, and fine particulate matter, which is made up of very small particles. Fine particulate matter is the main component of wildfire smoke and the principal threat to public health. Exposure to fine particulate matter of up to 24-hours has been associated with premature mortality, increased hospital admissions for heart or lung issues, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days.

The populations most impacted by reduced air quality are children, seniors, and people with chronic health conditions, outdoor workers, and people experiencing homelessness.

As discussed in the Environmental Justice Element, all 26 census tracts in Huntington Park are deemed "disadvantaged communities" defined as low-income areas disproportionately affected by environmental pollution.

Particulate matter of all sizes most impacts infants, children, and older adults with preexisting heart or lung diseases. Groups most sensitive to smog include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors, including outdoor workers. Smog has also been shown to have particularly disproportionate adverse impacts on populations experiencing homelessness and with lower median incomes. Outdoor workers and people experiencing homelessness will have greater levels of exposure to harmful air pollution.

DROUGHT

The number of days between rainstorms is known as a dry spell. In California there is a lot of variation in how much rain falls each year and in each storm. When the amount of rain from all storms in a year, or groups of years, is averaged together it can seem like there have not been major changes in the amount of rain that has fallen. However, the maximum length or dry spells is increasing, and is expected to increase through the end of century. End-of-century projections estimate an increase in the maximum length of dry spells between 7 to 16 days (RCP 4.5 - RCP 8.5) for a total maximum dry spell length of 167 to 176 days each year. These long periods without rain can lead to drought conditions. Dry, hard-packed soil, and impermeable surfaces like asphalt, can make it more difficult or impossible for water to filter into the ground when it rains, instead causing more storm water runoff. This can lead to temporary storm flooding in some areas, but it can also mean that water doesn't stay in the landscape and that big storms don't necessarily make up for long dry spells when it comes to relieving drought conditions.

More heat and less water can cause trees and plants to die if they are not given additional water. These can mean losing the benefits of green spaces (such as cooling and cleaning the air) and increasing cost to maintain them. Drought can lead to increased water rates, and higher water bills. Most impacted populations would be those with the fewest resources, including people experiencing homelessness, who may experience increased cost for and decreased access to water.

STORMWATER FLOODING

Though flooding in Huntington Park is currently infrequent and considered a low-probability event, the increased frequency of high-precipitation storms may contribute to increased storm flooding in localized areas throughout the city.

When an influx of stormwater exceeds a drainage system's capacity to infiltrate water into the soil or to carry it away, localized stormwater flooding can occur. Urban

landscapes tend to be built with lots of impermeable surfaces. Impervious surfaces, such as asphalt and pavement, don't allow water to infiltrate the ground, and storm water instead must travel along the ground's surface, as runoff. Most runoff is channeled into gutters and storm drains, and eventually into the regional flood channels. Existing development and drainage infrastructure was not built to manage stormwater flows from the increased precipitation events that are occurring and will continue to occur more frequently with climate change. Retrofitting these infrastructure systems can be costly.

Localized flooding could impact properties and leave roads temporarily unusable. Areas with high amounts of impermeable surfaces and those adjacent to drainage systems are prone to stormwater flooding during periods of heavy rainfall.

Flooding can cause water damage to property, disrupted commutes, trash and pollution in runoff, including the potential movement of hazardous materials in stormwater runoff, and potential loss of power during storms.

EMERGENCY EVACUATION

Emergency evacuation is an important component of disaster preparedness. Huntington park has a gridded street system that allows for efficient evacuation. The City does not have set evacuation routes and relies instead on a dynamic evacuation strategy which is based on the location and extent of the hazard or safety incident requiring evacuation, the speed in which evacuation needs to occur, and available evacuation locations. The grided street system allows for many viable evacuation routes in any given scenario. Therefore, the Safety Element does not identify pre-determined evacuation routes or locations, as evacuation routes will be dependent upon the location, extent, and type of hazard.

Responsibility for identifying emergency shelters is with the City Police Department. Their role is to identify facilities for evacuation in cases where shelter is required. Evacuation locations are typically located at local schools and parks, as judged appropriate for a particular evacuation scenario.

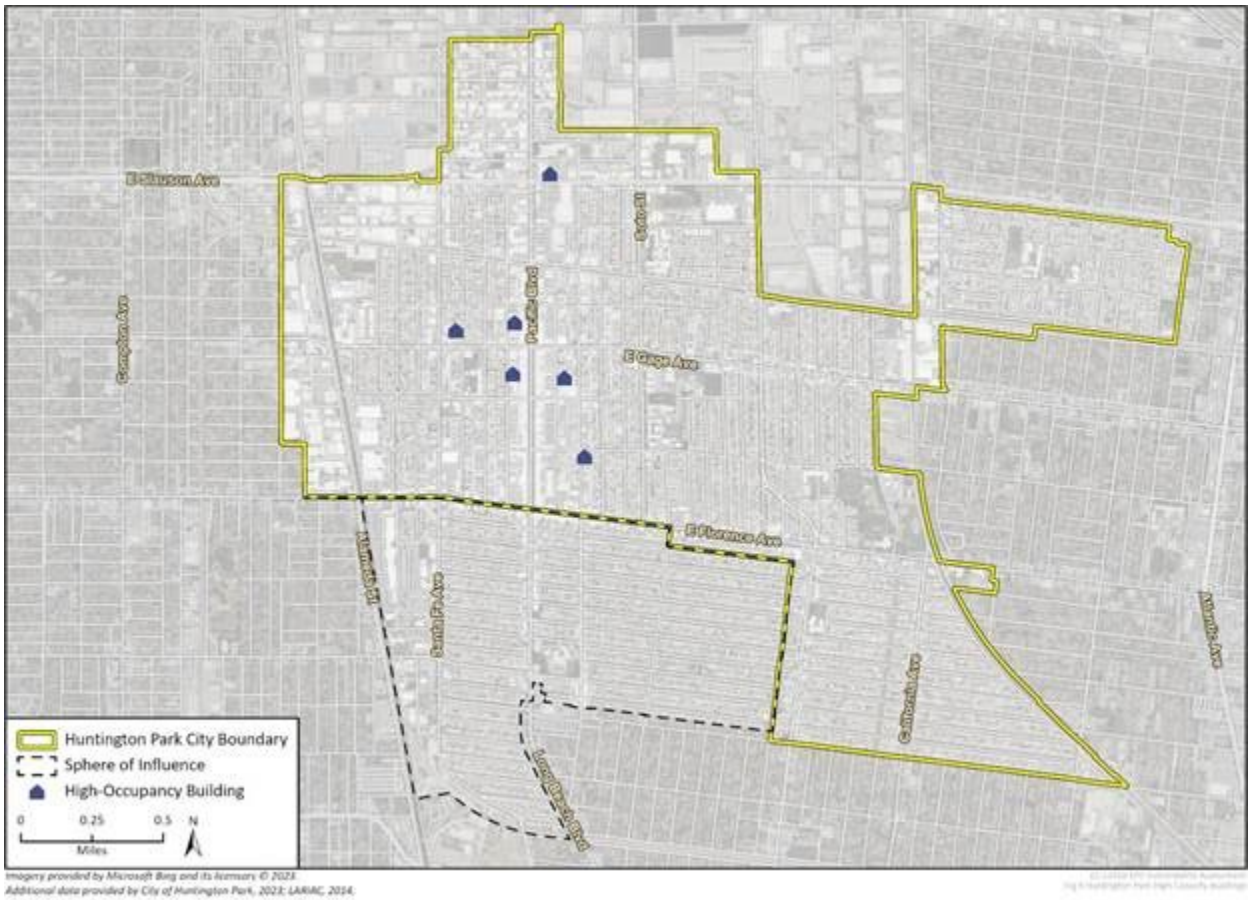
Consistent with Government Code Section 65302.15, the City conducted an emergency evacuation analysis to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. The City evaluated two emergency scenarios that were likely to occur in Huntington Park. The emergency scenarios were as follows:

- A hazardous material spill in the Alameda Corridor
- A structure fire at a high-occupancy senior living community

Evacuation routes and emergency shelter locations were selected for the specific scenarios evaluated. Under actual emergency conditions, situation-specific routes and emergency shelter locations would be determined by emergency responders, as appropriate. See Appendix S-2 for the full results of the analysis.

In keeping with Government Code Section 65302(g)(5), Safety Elements must also identify residential developments in hazard areas that do not have at least two emergency evacuation routes, referred to as single access roads. Single access roads are a local street that feeds into a collector with a singular point of entry and exit. These roads present potential evacuation complications necessitating added evacuation management. GIS evaluation of Huntington Park did not identify any neighborhoods with single ingress/egress. The gridded street system provides multiple evacuation route options for all areas of the city. However, the Fire Department and Police Department identified several buildings with a high number of residents or occupants that may require assistance evacuating. Occupants of these buildings could require additional resources and planning to ensure timely and safe evacuation despite the numerous ingress and egress routes. The locations of these high-occupancy buildings are included in Figure 4, below.

Figure 4 High Occupancy Buildings



3 PLANNING VISION

HEALTH AND SAFETY ELEMENT POLICIES AND PROGRAMS

The City of Huntington Park seeks to minimize the danger to residents, workers, and visitors to the City from the various hazards described within the Health and Safety Element with the implementation of the policies and programs outlined in the following section. The policies are arranged under each of the hazards discussed previously. Health and Safety programs will implement the policies identified in this section and are included under the relevant hazard and policy.

GOVERNANCE AND EMERGENCY PREPAREDNESS

Health and Safety Element Policy 1. The City of Huntington Park should incorporate climate change projections as part of updates to the local hazard mitigation plan and emergency preparedness plans, and as part of the development of other planning documents, including future park, urban greening, storm drain maintenance, or capital improvement plans.

> Program 1.1 Develop a review committee of appropriate staff members to explore the feasibility of incorporating climate impacts and related adaptation actions into relevant planning documents.

Health and Safety Element Policy 2. The City of Huntington Park should update and implement its Natural Hazard Mitigation Plan (NHMP) on a regular five-year cycle.

> Program 2.1 The City should update the HMP and submit it for FEMA approval. Upon adoption of the FEMA-approved HMP, the City should also adopt the HMP into this Health and Safety Element with the same resolution, thereby incorporating all identified policies, programs, and actions into this element.

Health and Safety Element Policy 3. The City of Huntington Park should adequately prepare its operations for emergencies and provide information and resources to residences to help households prepare for emergencies.

> Program 3.1 In the event of a major earthquake or other major disaster, persons living or working in the City may need to be self-sufficient for up to 72 hours before the results of any major relief efforts are realized. Under this program, a database will be created to identify medical professionals, heavy equipment operators, and volunteers trained in first aid and search-and-rescue. The database would identify other volunteers that would staff emergency collection centers, distribution centers, and otherwise assist in the recovery efforts. This information, and the appropriate procedures, would then be incorporated into the City's emergency preparedness plan.

Program 3.2 The City of Huntington Park should hold emergency drills to test the effectiveness of emergency operations plans.

Program 3.3 The City of Huntington Park should expand the emergency operations plan to improve evacuation coordination and assistance as well as post-disaster recovery. Additionally, it should explore new evaluation guidance options such as: stay-at-home requests for unaffected communities, early evacuations under high-risk conditions, implement access restrictions during evacuations.

Program 3.4 The City should develop an improved emergency alert and communications system for delivering evacuation orders and emergency notifications.

Health and Safety Element Policy 4. The City of Huntington Park should provide the community with information on available financial, technical, and educational resources and programming for reducing climate change risks and emergency planning, including on the topics of building weatherization, energy and water efficiency, signs of heat-related illness, and emergency preparedness. The City should distribute information about emergency planning to community groups, schools, churches, and business associations.

Health and Safety Element Policy 5. All educational, promotional, community engagement materials, City emergency preparedness plans, and emergency notifications shall be released by the City in both English and Spanish, consistent with Environmental Justice Element Policy 6.1.

Health and Safety Element Policy 6. The City of Huntington Park's development review process, and its engineering and building standards, should ensure that new construction is designed to minimize risks from geologic, fire, flood, and climate change-related hazards by ensuring the appropriate site planning and design of new development.

Health and Safety Element Policy 7. The City of Huntington Park should expand the resilience of critical facilities and infrastructure through assessment of needed retrofits to function properly while subject to increased climate hazard frequency including drought, stormwater flooding, extreme heat, and poor air quality.

Program 7.1 Encourage schools, hospitals, and critical facilities not operated by the City to identify and seek funding for necessary upgrades.

Program 7.2 Identify and seek funding for necessary upgrades to city-owned and operated critical facilities.

Health and Safety Element Policy 8. The City of Huntington Park should explore the feasibility and funding options for installation of self-sufficient energy systems in residential areas, such as microgrids, to minimize service disruptions during power outages triggered by a climate event or other disaster.

Health and Safety Element Policy 9. The City of Huntington Park should identify targeted and sustained funding sources to improve access to solar to alleviate high energy costs.

Health and Safety Element Policy 10. The City of Huntington Park should coordinate with emergency services as well as utility providers to assess needed service improvements in providing increased redundancy and uninterrupted service for water, power, and emergency service response.

EXTREME HEAT

Health and Safety Element Policy 11. The City of Huntington Park should partner with Los Angeles Unified School District to implement greening projects including renovations that result in removal of asphalt, creation of native plant gardens, planting of trees and development of shaded outdoor learning spaces, with a focus on schools in neighborhoods with fewer trees and less access to parks.

Health and Safety Element Policy 12. The City of Huntington Park should attempt to mitigate impacts from extreme heat through increased and equitable access to publicly accessible green spaces by implementing Housing Element Policy 5.7, Environmental Justice Element Policies 2.1, 2.2, 2.10, 2.12, 5.3, and Environmental Justice Element Programs 2.1.1, 2.2.1, 5.3.1, and 5.3.2. Greenspaces should be modified and designed to include climate-smart landscaping, shade structures, tree canopy, cooling amenities such as splash pads, and materials with low solar gain to improve usability on high heat days.

Program 12.1 Park programming should be adjusted to discourage high-intensity activities during peak heat periods, and provide additional cooling opportunities during warm nights, by potentially extending open hours to early morning or late evening.

Program 12.2 Establish climate-oriented standards for new green spaces, including watering and maintenance, shade, and access to drinking water.

Program 12.3 Conduct a park audit to evaluate existing facilities and identify climate-related improvements.

Program 12.4 Collaborate with schools in Huntington Park to provide landscaping maintenance and safety features to prevent and respond to vegetation drying and loss, provide shade, and maintain safe use through proper lighting and other measures.

Program 12.5 Identify funding to subsidize operation of the Splash Pads at Salt Lake Park and Freedom Park for reduced fees for public use during extreme heat events.

Health and Safety Element Policy 13. The City of Huntington Park should consider initiatives and promote design principles that increase the urban tree canopy through the planting and maintenance of additional climate-resilient trees, prioritizing neighborhoods with tree equity scores below 65, for provision of shade, cooling, and air quality benefits, consistent with the Environmental Justice Element Policy 5.7 and 1.18, and Programs 5.7.1, and 1.21.1.

Program 13.1 Seek funding from grant programs that support urban greening and community forestry projects, such as the Green Schoolyards Grant, to fund tree planting and maintenance projects.

Program 13.2 Explore the creation of a training program to support workforce development in urban forest management, tree planting, and green infrastructure development.

Program 13.3 Develop an urban forest maintenance program that includes partnerships with local community organizations to help engage and educate community members about tree care, while assisting with maintenance activities. The maintenance program should include plans for supplemental watering in the first three years after planting new trees to increase tree establishment and early growth.

Health and Safety Element Policy 14. The City of Huntington Park should reduce heat exposure in the use of public transit and active transportation by encouraging retrofits to bus stops and waiting areas to provide shade cover, and promoting design for thermal comfort for any new active transportation infrastructure including the incorporation of permeable or "cool" pavement, shading, lighting, and safety improvements consistent with the Housing Element Policies 1.6 and 5.8, and Environmental Justice Element Policies 2.3, 2.4, 5.5 and Programs 2.3.1, 2.3.2, 2.3.3, 2.4.1, 5.5.1.

Health and Safety Element Policy 15. The City of Huntington Park should encourage Southern California Edison to retain and enhance lifeline programs for life sustaining services for priority populations, especially due to hazards such as an increase in high heat days and the potential for related power disruptions, and work to increase awareness of these programs among residents.

Health and Safety Element Policy 16. The City of Huntington Park should encourage Southern California Edison to address financial obstacles to the use of air conditioning and other indoor cooling strategies, by setting electricity rates at the point of affordability during peak demand hours for HVAC, especially for priority populations.

Health and Safety Element Policy 17. The City of Huntington Park should mitigate the compounding impact of housing conditions and extreme heat on public health by improving the housing stock, with the aim of reducing overcrowding, increasing affordability, encouraging new developments and home retrofits to include heating, ventilation and air conditioning (HVAC) upgrades or installations, improve insulation,

and replace aging roofs, consistent with Housing Element Policies 2.5, 2.7, and Program 1, and Environmental Justice Element Policies 4.2, 4.5, 4.6, 4.10, 4.11, 4.12 and Programs 4.2.1, 4.10.1, 4.10.2, 4.12.1, 4.12.2.

Program 17.1 Amend the building code to include a requirement that new developments include HVAC.

Program 17.2 Include cooling-related retrofits, such as improved insultation, new windows, new or improved HVAC systems, and roof repair and replacement in home improvement funding programs consistent with Environmental Justice Element Program 4.10.1.

Health and Safety Element Policy 18. The City of Huntington Park should help mitigate the risk of heat-related health impacts to people experiencing and at risk of homelessness by coordinating with local service providers such as the Los Angeles Area Homeless Services Agency (LAHSA) to support provision of housing support services and facilities consistent with the Housing Element Policy 5.4.

Program 18.1 Collaborate with local service providers to ensure community members experiencing homelessness are aware of the available cooling center locations and hours, symptoms and signs of heat illness, and available resources for accessing medical attention if suffering from heat illness.

Program 18.2 Coordinate with churches or other community groups to offer additional cooling services for community members experiencing homelessness during heat waves.

Health and Safety Element Policy 19. The City of Huntington Park should consider the provision of additional cooling access by advocating for expanded operating hours and high-quality HVAC at the Huntington Park Library, consistent with the Environmental Justice Element Policy 2.7 and programs 2.7.1 and 2.7.2, including advocating for special extended early morning and late evening hours during heat waves and considering potential use of existing public facilities as cooling facilities during heat waves.

Program 19.1 The City should seek funding and partner with local CBOs to establish a resilience hub in the city that is operated by a local community organization which can serve as a safe space during climate induced events, including high heat days and warm nights.

Health and Safety Element Policy 20. The City of Huntington Park should consider increasing the capacity of community health care services that will be impacted by increased heat health events.

AIR QUALITY

Health and Safety Element Policy 21. The City of Huntington Park should promote strategies that help improve air quality and reduce greenhouse gas emissions by expanding access to public transportation, restricting truck routes and idling time, improving provisions for bicyclists and pedestrians, and encouraging mixed use and higher density development around transit stations, consistent with the City's Environmental Justice Element Policies 1.10, 1.11, 2.3, 2.11 and Programs 1.10.1, 1.10.2, 1.10.3, 2.3.1, 2.3.2, 2.3.3, 2.11.1 and Housing Element Policies 1.6 and 5.8.

Health and Safety Element Policy 22. The City of Huntington Park should discourage new land uses with potential adverse air quality impacts, including the emission of toxic air contaminants and fine particulates, near residential neighborhoods, schools, hospitals, nursing homes, and other locations where public health could potentially be affected, consistent with the Environmental Justice Element Policy 1.12.

Health and Safety Element Policy 23. The City of Huntington Park should reduce particulate matter and the impacts of particulate matter and other air pollutants consistent with the Environmental Justice Element Policies 1.1, 1.2, 1.4, 1.6, 1.21 and Programs 1.1.1, 1.2.1, 1.4.1, 1.4.2, and 1.6.1.

Health and Safety Element Policy 24. The City of Huntington Park should provide informational resources regarding air pollution health risks and personal adaptation options consistent with the Environmental Justice Element Policy 1.3 and Programs 1.3.1 and 1.3.2.

Health and Safety Element Policy 25. The City of Huntington Park should raise awareness about local asthma risks and personal mitigation strategies and help to mitigate the risks of undiagnosed asthma consistent with the Environmental Justice Element Policies 5.1 and 5.8, and Programs 5.1.1, 5.8.1, and 5.8.2.

Health and Safety Element Policy 26. The City of Huntington Park should consider retrofitting critical facilities under the City's operational control with air filtration devices to reduce indoor air pollution.

FLOODING

Health and Safety Element Policy 27. The City of Huntington Park should work with the Los Angeles County Department of Public Works to identify and implement needed local and regional storm drain improvements to relieve local flooding problems in Huntington Park which are anticipated to increase in frequency and severity due to climate change.

> Program 27.1 Coordinate with the LA County Department of Public Works as it conducts a comprehensive assessment of the current condition of the storm drain system, provide local knowledge of storm drain condition, areas of localized stormwater flooding, and equity needs.

Program 27.2 Partner with the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA) and LA County Department of Public Works to secure funds to implement any needed improvements to critical storm drain infrastructure and address maintenance needs on a regular schedule. Consider upgrading storm drain infrastructure based on climate induced changes in precipitation patterns rather than historical rain events.

Program 27.3 Distribute informational resources to residents and business on proper disposal of waste and debris that can clog the storm drain system, and strategies that can limit on-site flooding.

Program 27.4 Develop a system for reporting and addressing drainage issues in a timely manner.

Health and Safety Policy 28. The City of Huntington Park should revise and update construction codes and regulations to incorporate the increased use of green infrastructure in new developments as a means of improving stormwater quality.

Program 28.1 Provide developer education on low-cost and best practice drainage improvements. Explore the establishment of an incentive program for developers who incorporate green infrastructure into their designs.

Health and Safety Policy 29. The City of Huntington Park should incorporate green infrastructure into street design and maintenance. This should include the incorporation of low impact development (LID) drainage design in public and private streets and parking lots. This also includes the use of best management practices to reduce impervious surfaces, including strategies using vegetation, soils, and natural processes to manage water and create a healthier urban environment.

DROUGHT AND WATER QUALITY

Health and Safety Element Policy 30. The City of Huntington Park should disseminate education and outreach materials regarding the City's conservation measures to decrease water use consistent with Housing Element Programs 6-2, 6-3.

Program 30.1 The Department of Public Works should conduct a water audit of all city-owned buildings and facilities and implement water-saving measures by 2025.

Program 30.2 The City should continue to promote rebate programs for replacement of appliances with more efficient versions on the City website.

Program 30.3 The City should explore the feasibility of incentives for businesses that participate in water conservation efforts through the City's Business Assistance Program.

Health and Safety Element Policy 31. The City of Huntington Park should continue to implement the Watershed Management Program (WMP), including regular ground water quality monitoring, and scheduled street sweeping aimed at reducing pollution

runoff into the Los Angeles River Basin. These programs should emphasize best management practices by residents, businesses, contractors, and public agencies to ensure that surface water quality is maintained at levels that meet state and federal standards.

Health and Safety Element Policy 32. The City of Huntington Park should promote water efficiency best practice and leakage repairs.

> Program 32.1 Through public works develop a public outreach campaign on ways to reduce water use in homes and offer leakage repair services to priority populations as well as assistance for appliance replacements.
>
> Program 32.2 Partner with water utilities and seek funding to distribute leakage detection technologies, such as the Flume app, to eligible properties with compatible water meters.

Health and Safety Element Policy33. The City of Huntington Park should ensure adequate access to clean drinking water in the public realm by requiring public facilities to install public hydration stations, incorporate hydration stations in all recreational and park facilities, where feasible.

SEISMIC HAZARDS

Health and Safety Element Policy 34. The City of Huntington Park shall continue to implement the City's seismic hazard abatement program for existing un-reinforced buildings.

Health and Safety Element Policy 35. In areas with liquefaction potential, the City of Huntington Park shall require review of soils and geologic conditions, and if necessary, on-site borings, to determine liquefaction susceptibility of the proposed site.

Health and Safety Element Policy 36. The City of Huntington Park shall maintain and periodically review emergency procedures for earthquakes in the City's Disaster Response Plan.

Health and Safety Element Policy 37. The City of Huntington Park shall promote earthquake preparedness within the community by participation in quake awareness programs, including distribution of brochure materials in Spanish and English. The City will encourage property owners to anchor buildings to their foundations, bolt water heaters to walls, and implement other preventive measures.

> Seismic Safety Program The City enforces the seismic retrofit requirements of the State of California Uniform Building Code. These standards apply to bracing systems, wall anchors, and the filling in of excess openings. The City has adopted an Earthquake Hazard Reduction Ordinance to address ground-shaking hazards in the City. Department personnel are trained to use the Emergency Response Handbook.

HAZARDOUS MATERIALS

Health and Safety Element Policy 38. The City of Huntington Park shall locate new and existing land uses involved in production, storage, transportation, handling, and/or disposal of hazardous materials a safe distance from other land uses that may be sensitive to such activities.

Health and Safety Element Policy 39. The City of Huntington Park shall coordinate with Los Angeles County in sponsoring regular household hazardous waste disposal programs to enable residents to bring backyard pesticides, cleaning fluids, paint cans, and other common household toxics to a centralized collection center for proper disposal.

Health and Safety Element Policy 40. The City of Huntington Park shall cooperate with the County in local implementation of applicable portions of the Los Angeles Hazardous Waste Management Plan.

Health and Safety Element Policy 41. The City of Huntington Park shall consult with companies operating underground pipelines, as well as the Public Utilities Commission and Office of Pipeline Safety, to determine the likelihood of explosion or rupture in case of accident or earthquake and shall ensure that the Fire Department and other disaster response agencies have access to route, depth, and shut-off information about each line.

Hazardous Materials Control Program. The City shall continue to cooperate with County, State, and Federal agencies involved in the regulation of hazardous materials' storage, use, and disposal. The City shall work with the fire department in requiring hazardous materials users and generators to identify safety procedures for responding to accidental spills and emergencies. The LACFD shall also work with local law enforcement officials in regulating the transport of hazardous materials through the City. The City will continue to promote the safe disposal of "hazardous and toxic substances" used in private households through the support of "Hazardous Materials Collections" conducted at specific locations and times within Huntington Park. The City will continue to collect and maintain up-to-date records concerning the type, location, owners, and responsible persons for properties which involve the handling of hazardous materials and wastes.

Community Hazardous Waste Education Program. The City will implement an education program for households and small businesses regarding identification and disposal of potential hazardous wastes, including machine oils, pesticides, etc.

EVACUATION

Health and Safety Element Policy 42. The City of Huntington Park shall be prepared to efficiently mobilize City staff and use communications systems to facilitate efficient and equitable emergency evacuation.

Program 42.1 Develop a cross department evacuation coordination taskforce in charge of evacuation route maintenance, annual hazard-based evacuation scenario trainings, identification of neighborhoods and households containing vulnerable populations, additional assistance required populations, communication of real time traffic congestion and conditions during an evacuation, and general outlined evacuation planning and trainings. This taskforce will meet regularly with staff from relevant departments to additionally oversee the updates to emergency planning documents and processes.

Program 42.2 Explore the feasibility of partnering with LA Metro and other transportation operators to provide buses and vans to assist with timely evacuation of high-occupancy buildings or community members with limited access to transportation during an emergency.

Program 42.3 Publish the City's Emergency Operations Plan, evacuation information, and resources for emergencies on the City website.

Health and Safety Element Policy 43. The City of Huntington Park shall adopt communication tools to reach at-risk communities and coordinate with local service providers to assist vulnerable populations such as the unhoused, elderly, and young children with evacuations.

Program 43.1 Facilitate community outreach to at-risk populations throughout the community through educational materials and real time evacuation assistance through the cross-department evacuation coordination taskforce.

Program 43.2 Expand emergency alert systems so the Police Department, Los Angeles County Fire Department, and cross-department evacuation taskforce can coordinate advanced mobilization and facilitate evacuations during emergencies.

Program 43.3 Provide property owners, tenants, renters, and landlords of high-occupancy buildings with evacuation checklists as well as information on available resources during different emergencies.

4 PUBLIC SAFETY PLAN

EMERGENCY PREPAREDNESS PROGRAM

The City originally adopted a Civil Defense and Disaster Plan in 1972 and this Plan was updated in February 1983. The Huntington Park Police Department has adopted procedures for dealing with hazardous spills on the highway. These procedures are based on the California Highway Patrol's and the Federal Department of Transportation's Emergency Response Materials. To ensure emergency water supply throughout the City, new construction is required to meet specific fire flow standards. Fire flows for individual structures are calculated according to size of the structure (floor area), type of construction (wood, non-combustible, fire-resistive), building height, presence of sprinkler systems, distance between buildings, and type of use.

FIRE PROTECTIVE STANDARDS FIRE FLOW

The Los Angeles County Fire Department's Fire Prevention Bureau determines the minimum flows for new construction based on building plans and developers are responsible for providing adequate fire flows. This ensures that hydrant capacity is available to meet fire emergency needs of all developments. The City of Huntington Park follows the County Fire Department Fire Code standards for fire flows and emergency access roads. Fire flows of 1,000 gallons per minute (gpm) to 5,000 gpm at 20 pounds per square inch (psi)of residual pressure for a duration of two to five hours is needed for residential and commercial uses, with hydrants every 300 to 600 feet, based on the type of occupancy. The fire standards outlined above are subject to the following conditions:

Fire flow increases with building size (square feet) and/or lot coverage: 20 psi and 600 feet hydrant spacing is required for single-family dwelling, and 20 psi and 300 feet hydrant spacing is required for all other occupancies.

Road width increases where parallel parking allowances, hydrant requirements, or serial fire suppression requirements, or aerial fire suppression requirements indicate the need.

Minimum 20 feet private road width is permitted only if life safety is not jeopardized, topography, or lot shape/dimensions are constraints, and the Fire Department grants discretionary approval.

A paved access is required if any portion of the first-floor building exterior is more than 150 feet from a public vehicle access (private driveway, bridge, alley).

Final fire flow will be based on the size of the building, its relationship to adjacent structures and the type of construction.

Table 2 Fire Standards

Development	Fire Flow (gpm)	Road Width (feet)	Access (feet)	Turn Radius (feet)
Single-Family (Fire Zone 4)	1,000-1,250	20-26	150	32
Single-Family (Fire Zone 3)	750-1,250	20-26	150	32
Two-Family (Duplex)	1,500	26-36	150	32
Mobile Home (Fire Zone 4)	1,250	26-36	150	32
Multi-Family & Hotel	1,000-5,000	26-36	150	32
Schools	1,000-5,000	26-36	150	32
Commercial & Industrial	1,000-5,000	26-42	150	32
High-Rise (5-stories/75')	5,000	NA	NA	32
Source: Los Angeles County Fire Department Fire Code				

FIRE PROTECTION STANDARDS PEAK LOAD WATER SUPPLY

The water system must be capable of supplying adequate quantities of water for firefighting purposes, in addition to the daily supply for domestic demand in the area. Adequate reservoir capacity is determined by the availability of water for peak day supply plus fireflow requirements. Generally, peak day supply is twice the average day demand and total fire flow requirements are estimated by the population of the area. Table 2 lists the Los Angeles County Fire Department Fire Code Standards for water flow, road width, and property accessibility for adequate fire response.

FIRE PROTECTION STANDARDS EMERGENCY ACCESS

The provision of adequate roadway widths will facilitate emergency response during a disaster. The City supports fire access standards that have been established by the County Fire Department to ensure access for firefighting equipment to all areas of the City.

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CITY OF HUNTINGTON PARK GENERAL PLAN

HEALTH AND SAFETY ELEMENT

Appendix S-1
Climate Change Vulnerability Assessment

City of Huntington Park

Climate Change Vulnerability Assessment

March 2023

Prepared by
Rincon Consultants, Inc.

Table of Contents

Tables

Figures

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Executive Summary

The City of Huntington Park Climate Change Vulnerability Assessment evaluates how climate change may impact community members, natural resources, critical facilities, buildings, services, and infrastructure in Huntington Park. This report will inform the development of climate adaptation goals, policies, and implementation programs for the Health & Safety Element as part of the City's General Plan Update.

Climate change is a global phenomenon that can impact public health, natural resources, infrastructure, emergency response, and other aspects of society at the local scale as the averages and extremes of climate conditions change. In Huntington Park, temperature and precipitation are expected to change in the following ways:

- **Increasing temperatures.** Average maximum temperatures in Huntington Park are expected to increase between 3.6° Fahrenheit (F) and 4.4°F by 2050 and between 4.6°F and 7.6°F by 2100.
- **Increasing intensity of precipitation events and longer dry periods.** It is projected that more precipitation will occur during extreme storm events and dry periods will be longer and more frequent.

Changes in temperature and precipitation are expected to influence the frequency, duration, and magnitude of a variety of climate hazards. Climate change models indicate that Huntington Park is expected to experience the following by the end of the century:

- **Extreme Heat.** Huntington Park is projected to experience an increase in the annual number of extreme heat days in the coming decades. In Huntington Park, an extreme heat day occurs when the maximum temperature is above 96.1°F. The annual number of extreme heat days is projected to increase by as much as 21 days and the annual number of warm nights is projected to increase by as much as 63 nights by 2100.
- **Drought.** The City is projected to experience increases in the length of dry spells.
- **Stormwater Flooding.** Climate change may cause changes in precipitation patterns, leaving low-lying and highly paved areas throughout Huntington Park exposed to more frequent stormwater flooding.
- **Air Quality.** Air quality within the Los Angeles region is projected to worsen because of an increase in regional wildfires and average maximum temperature. Longer periods of drought will also contribute to worsening air quality.

Report Organization

The report is comprised of the following sections:

1. **Introduction** describes the methodology and key data sources used to prepare the Climate Change Vulnerability Assessment.
2. **Exposure to Climate Hazards** outlines climate drivers (GHGs in the atmosphere), climate indicators (temperature and precipitation), relevant climate hazards, historical hazard events, how hazards are expected to change, and includes figures mapping climate hazards spatially across Huntington Park.
3. **Sensitivity** identifies populations and assets most at risk to climate change.
4. **Adaptive Capacity** summarizes plans, policies, and programs that help Huntington Park cope with climate hazard events.

5. **Vulnerability Analysis** describes potential impacts for each hazard based on sensitive communities, natural, and built assets, with consideration given to their adaptive capacity. The chapter includes vulnerability scores of low, medium, or high for each population group and asset. See Vulnerability Scoring Methodology section below for more detail.
6. **Conclusion** presents the key findings of this report.

Populations, Assets, and Services at Risk

Projected changes in climate indicators and hazards will adversely impact community members, natural resources, critical facilities, buildings, services, and infrastructure in Huntington Park. Priority populations are comprised of those community members that have either higher exposure, increased physiological sensitivity, or experience societal factors that increase risk from climate change hazards. The Huntington Park Climate Change Vulnerability Assessment describes the impacts climate change is expected to have on the following populations and assets:

Priority Populations

- Individuals with high outdoor exposure
- Under-resourced individuals
- Individuals facing societal barriers
- Individuals with chronic health conditions or health related sensitivities

Natural and Recreational Resources

- Municipal parks & open spaces
- Urban forest

Buildings and Facilities

- Municipal buildings
- Educational facilities
- Hospitals
- Residential and commercial development
- Fire stations
- Police stations

Infrastructure and Critical Services

- Water services
- Wastewater
- Storm drainage and flood protection
- Solid and hazardous waste and recycling
- Fire services
- Emergency services
- Medical services
- Utilities and major utility corridors
- Public transportation
- Roadways
- Active transportation routes

Adaptive Capacity

Adaptive capacity is the ability to adjust to the consequences of climate change. Types of adaptive capacity include adjustments in behavior, resources, processes, and technologies. Huntington Park is currently taking steps to increase the City's adaptive capacity by reviewing and updating existing policies, plans, programs, and institutions that contribute to the City's resilience to climate change hazards. There are existing plans, programs, and policies in place to mitigate some impacts of stormwater flooding, drought, and power outages from extreme heat on the City's buildings, facilities, infrastructure, and critical services. Policies and programs related to air quality and extreme heat are included in the recently adopted Environmental Justice Element.

Vulnerability Analysis

Understanding local climate risks and impacts allows communities to prepare for the future and increase their resilience. Population groups and asset categories with higher risk from climate hazards are described below.

Priority Populations

- **Extreme Heat.** Increased number of extreme heat days will result in increased public health risks, particularly to populations with increased exposure or sensitivity, through heat-impacted diseases and air quality degradation. Individuals with high outdoor exposure, under-resourced individuals, individuals facing societal barriers, and individuals with chronic health conditions are all susceptible to extreme heat.
- **Drought.** Individuals with high outdoor exposure are particularly at risk to drought conditions. During prolonged drought conditions, people experiencing homelessness may have difficulty accessing clean and affordable drinking water.
- **Stormwater Flooding.** Outdoor workers may be exposed to hazardous work conditions during stormwater flooding events and therefore are more likely to experience health impacts. People experiencing homelessness are disproportionately at risk of health impacts during flood events because they often live in flood hazard areas and do not have access to transportation or resources needed to evacuate inundated areas.
- **Air Quality.** Individuals with high outdoor exposure and individuals with chronic health conditions are particularly at risk of negative impacts from poor air quality. Outdoor workers and people experiencing homelessness are disproportionally exposed to air pollutants because they spend much greater time outdoors. Individuals with chronic health conditions or health related sensitivities are at risk of developing or experiencing exacerbated health impacts from poor air quality. Children are extremely susceptible to health impacts from poor air quality because their respiratory system has not fully developed yet. Older adults and pollution burdened individuals are disproportionately impacted by poor air quality because they are more likely to have underlying respiratory and/or cardiovascular conditions. Individuals with cardiovascular disease and individuals with asthma may experience severe health impacts if exposed to poor air quality.

Natural and Recreational Resources

- **Extreme Heat.** Natural and recreational resources are highly exposed to extreme heat and warm nights. Plants are more

likely to experience heat stress and drying. Urban wildlife under these conditions face impacts of heat stress and heat related illness as well as disrupted reproductive cycles.

- **Drought.** Impacts from drought involve risks associated with water scarcity and availability for reliant natural and recreational resources such as parks and open space. There is a risk of generally water-stressed resources and increased maintenance costs.
- **Stormwater Flooding.** Stormwater flooding will reduce overall water quality through transport of debris and pollutants in runoff.
- **Air Quality.** The direct effects of air quality declines on natural resources relates to plant and wildlife health as increased air pollutants causes stress and mortality. Impacts from air quality can further impact natural resources since air quality declines correspond with other hazards such as extreme heat, compounding the risks.

Buildings and Facilities

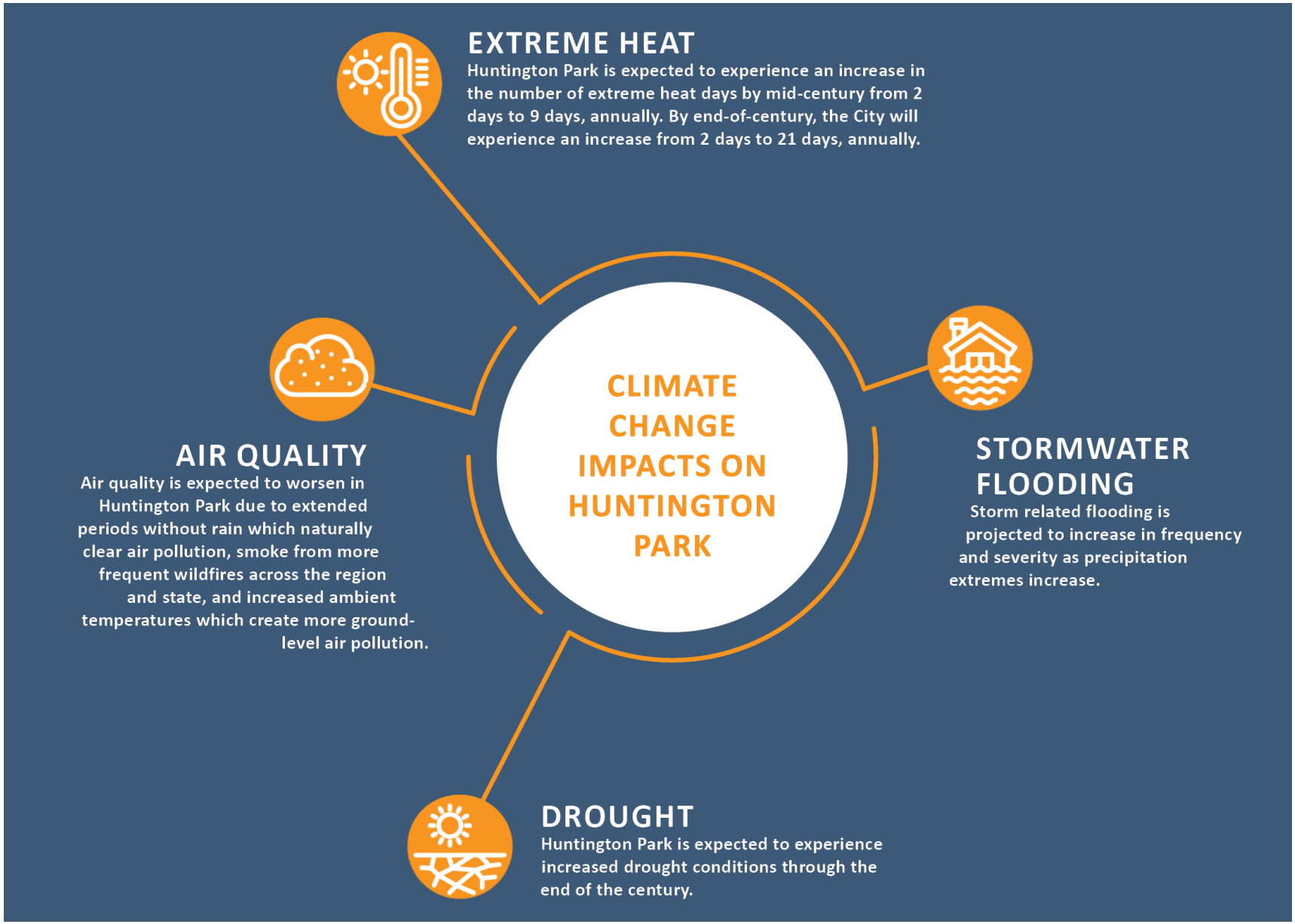
- **Extreme Heat**. Extreme heat could strain HVAC systems and increase cooling and maintenance costs for buildings and facilities that are not adequately weatherized for increased temperatures.

Infrastructure and Critical Facilities

- **Extreme Heat**. Extreme heat affects roadways, active transportation routes, and railroads creating vulnerabilities to damages through sustained heat. Electrical infrastructure is also at risk of grid overload through increased power demand.
- **Drought.** Drought can impact water reliability and water infrastructure. All emergency services depend on water, particularly firefighters who require adequate water supply for fire suppression. Drought vulnerability can create service strain for emergency and medical services.
- **Stormwater Flooding.** Impervious surfaces can impede the absorption of water and augment stormwater flooding in areas of Huntington Park. There is risk of damage from increased extreme precipitation events including erosion, washouts, and an influx of debris and pollutants in runoff. Storm drainage and flood protection services for the City may be impacted by these events.
- **Air Quality** Higher incidence of unsafe air quality generated by increased smog, dust and interactions with higher temperatures can create general strain on existing infrastructure and critical services through increased rates of hospitalization and demand on emergency and medical services.

Key Findings

The Climate Change Vulnerability Assessment identifies the community members, natural resources, critical facilities, buildings, services, and infrastructure most susceptible to climate change hazards in Huntington Park. Although the City has some policies and programs in place to prepare for climate related hazards, gaps remain as summarized in the Climate Change Vulnerability Assessment. This assessment is a starting point for establishing adaptation policies and programs in the Huntington Park Health & Safety Element.


EXTREME HEAT
Huntington Park is expected to experience an increase in the number of extreme heat days by mid-century from 2 days to 9 days, annually. By end-of-century, the City will experience an increase from 2 days to 21 days, annually.
CLIMATE CHANGE IMPACTS ON HUNTINGTON PARK
AIR QUALITY
Air quality is expected to worsen in Huntington Park due to extended periods without rain which naturally clear air pollution, smoke from more frequent wildfires across the region and state, and increased ambient temperatures which create more ground-level air pollution.
STORMWATER FLOODING
Storm related flooding is projected to increase in frequency and severity as precipitation extremes increase.
DROUGHT
Huntington Park is expected to experience increased drought conditions through the end of the century.

1 Introduction

1.1 Background on Climate Change

This report evaluates how climate change may impact vulnerable community members, natural and recreational resources, buildings and facilities, and services and infrastructure in Huntington Park. This report is consistent with Government Code § 65302 (as amended by Senate Bill (SB) 379) which requires cities and counties across California to prepare a Climate Change Vulnerability Assessment to inform updates to the Health & Safety Element of the General Plan. Understanding the City's vulnerabilities to climate change provides a foundation to develop required climate adaptation goals, policies, and implementation programs for the City's Health & Safety Element.

Causes of Climate Change

Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface raising global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry (NASA 2022). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years (IPCC 2021). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2022).

1.2 Huntington Park Snapshot

Huntington Park is centrally located within the greater Los Angeles metropolitan area. It is located about five miles southeast of downtown Los Angeles. The City borders the cities of Vernon and Maywood to the north, the City of South Gate and unincorporated Los Angeles County to the south, cities of Cudahy and Bell to the east, and the City of Los Angeles and unincorporated Los Angeles County to the west. The City of Huntington Park was first incorporated in 1906, and currently has a population of approximately 59,515 residents. The City has a land area of approximately 3.01 square miles.

1.3 Lexicon

Several words and phrases are used throughout the plan to illustrate climate vulnerabilities within Huntington Park.

- **Adaptation.** The process of adjustment to actual or expected climate and its effects, either to minimize harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate (IPCC 2012).
- **Adaptive Capacity.** The City of Huntington Park's ability to cope with and adjust to the impacts of climate change (Cal OES 2020).
- **Asset.** Refers to a resource, structure, facility or service that is relied on by a community.
- **Cascading Impact.** Climate hazard caused impacts that compromise infrastructure or disrupt critical services (i.e., power supply or water conveyance) broadening the scope of impact past a singular subject to reliant subsystems and populations (Collins et al. 2019).
- **Climate Driver.** An increase in the proportion of greenhouse gases in the atmosphere is the primary human-caused driver of change to the earth's climate (USGCRP 2017).
- **Climate Hazard**. A dangerous or potentially dangerous condition created by the effects of the local climate (Cal OES 2020). Climate hazards of concern for Huntington Park are extreme heat and warm nights, drought, stormwater flooding, and air quality.
- **Climate Indicator.** A measure of a particular aspect of the earth's climate that can be tracked over time to show trends and changes in climate. Climate indicators relevant to the City of Huntington Park and discussed in this report are temperature and precipitation.
- **Compounding Risk**. When two or more extreme events or average events occur simultaneously and increase the scope of impact or severity of the event; an additional risk brought about by increased frequency of events from climate change (Seneviratne et al. 2012).
- **Impact.** Effects on natural and human systems including effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate hazards and the vulnerabilities of the system or asset effected (IPCC 2012).
- **Mitigation.** An act or sustained actions to reduce, eliminate, or avoid negative impacts or effects (Cal OES 2020).
- **Resilience.** The capacity of an entity (an individual a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (Cal OES 2020)
- **Sensitivities**. The degree to which a species, natural system, community, asset, or other associated system would be affected by changing climate conditions (Cal OES 2020).
- **Priority Populations**. Certain populations experience increased exposure, risk, or sensitivity to climate change impacts and often have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts (Cal OES 2020). Assessing and mitigating impacts to these populations is prioritized given the increased risks and sensitivities.
- **Vulnerability.** The propensity or predisposition to be adversely affected (IPCC 2012).

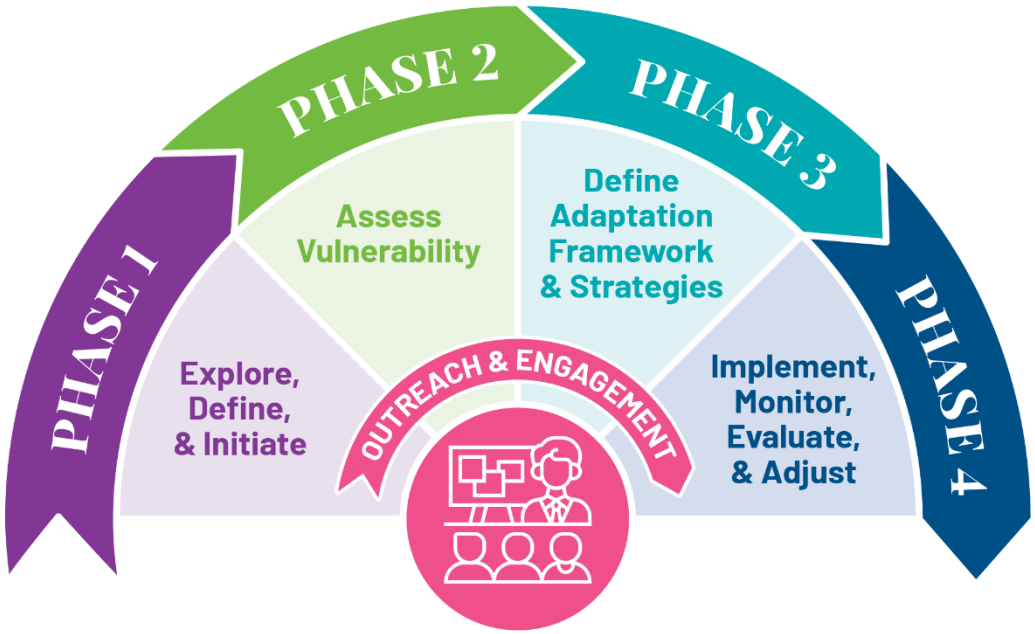
1.4 Vulnerability Assessment Methodology

The following section details state guidance, methods, and sources used in the production of this report.

California Adaptation Planning Guide Phases

The Huntington Park Climate Change Vulnerability Assessment follows the vulnerability assessment process recommended by the California Governor's Office of Emergency Services (Cal OES), as documented in the 2020 California Adaptation Planning Guide (Cal APG).

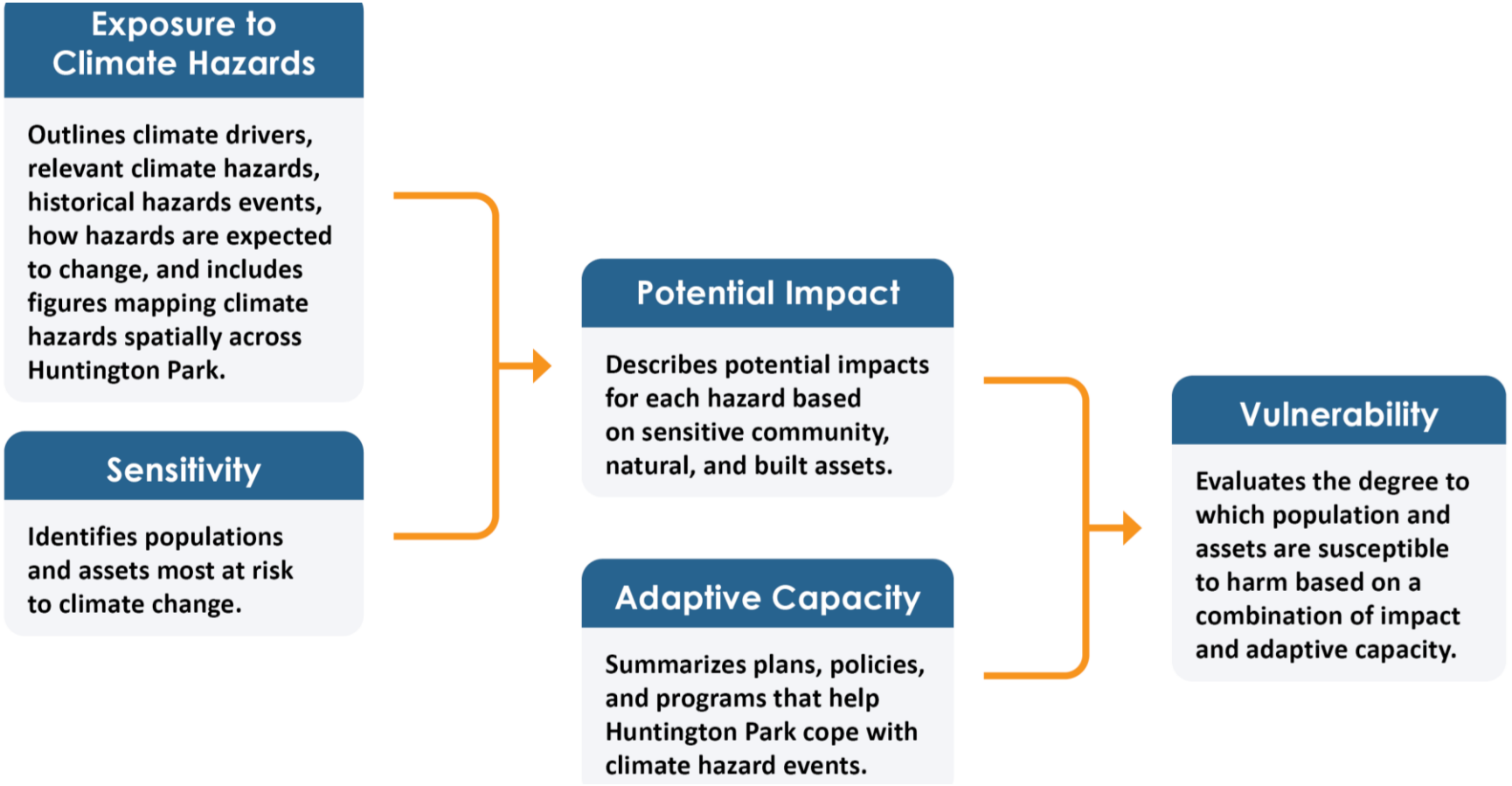
The adaptation planning process outlined by the Cal APG consists of four phases, illustrated in the graphic below. Phase 2 is comprised of the vulnerability assessment process (Cal OES, 2020).



Source: 2020 California Adaptation Planning Guide

The Huntington Park Climate Change Vulnerability Assessment is consistent with Phase 2 of the 2020 Cal APG and is composed of the following parts found in Figure 1.

Figure 1 Vulnerability Assessment Flow Diagram



Vulnerability Scoring Methodology

Vulnerability scoring is a valuable step in the climate vulnerability assessment process because it identifies which assets and populations face the greatest threat from climate hazards. This can aid in the prioritization of adaptation actions. The vulnerability score is a combination of the impact and adaptive capacity scores.

The impact and adaptive capacity scores are developed using a qualitative methodology outlined in the Cal APG, as seen in Table 1. Impact and adaptive capacity scores are assigned for each climate hazard for all assets and sensitive populations. The vulnerability score is prepared by combining the two scores as demonstrated in Table 2. The range of potential impacts spans 1 through 5 with 4-5 representing the highest levels of potential impact.

Table 1 Impact and Adaptive Capacity Scoring Rubric

Score	Impact	Adaptive Capacity
Low	Impact is unlikely based on projected exposure; would result in minor consequences to public health, safety, and/or other metrics of concern.	The population or asset lacks capacity to manage changes; major changes would be required.
Medium	Impact is somewhat likely based on projected exposure; would result in some consequences to public health, safety, and/or other metrics of concern.	The population or asset has some capacity to manage climate impact; some changes would be required.
High	Impact is highly likely based on projected exposure; consequences to public health, safety, and/or other metrics of concern.	The population or asset has high capacity to manage climate impact; minimal to no changes are required.

Source: Cal OES 2020

Table 2 Vulnerability Score Matrix

Potential Impacts	**High**	3	4	5
	Medium	2	3	4
	Low	1	2	3
		High	**Medium**	**Low**
		Adaptive Capacity		

Source: Cal OES 2020

Social Sensitivity Methodology

The presence and overall distribution of priority populations in the City of Huntington Park were identified based on Healthy Places Index (HPI) and U.S. Census and American Community Survey (ACS) data unless supplemented with additional data sources specifically mentioned in discussion of particular populations. This report follows the Southern California Association of Governments (SCAG) Southern California Adaptation Planning Guide (SoCal APG) methodology for identifying, grouping, and analyzing vulnerable populations.

The SoCal APG identifies the following populations as generally experiencing higher risk for climate impacts in a given community:

- Low income
- Experiencing homelessness
- Incarcerated
- Unemployed or underemployed
- Seniors and young children
- Military veterans
- Non-white communities
- Renters
- Students
- Visitors and seasonal residents
- Outdoor workers
- Single female heads of households
- Undocumented immigrants
- Non-English speakers
- Tribal and indigenous communities
- Individuals with impaired health/disabilities
- Isolated individuals (e.g., no car or transit access)
- Individuals with educational attainment less than 4 years of college

Priority populations were identified in Huntington Park through several state recommended data sources. For groups analyzed using U.S. Census data, the report identified populations in Huntington Park present at higher rates than the statewide average. For populations analyzed using the Healthy Places Index, this report used a percentile score of 25 or lower to designate vulnerable populations. Huntington Park's sensitive populations are described in the Populations, Assets, and Services at Risk section later in this report.

Key Data Sources

The following data sources and tools, many of which are recommended within the Cal APG and SoCal APG, were used in preparation of this report.

- **The California Healthy Places Index (HPI)** is an online mapping tool that reports on community conditions that are known to predict health outcomes and life expectancy. The tool was prepared by the Public Health Alliance of Southern California, a collaborative of local health departments in Southern California. The Healthy Places Index displays 25 community characteristics at various legislative boundaries, including census tracts and city and county boundaries. The community characteristics relate to the following identified Policy Action Areas: economic, education, housing, health care access, neighborhood, clean environment, transportation, and social factors. The Healthy Places Index applies a relative percentile score across all census tracts in California using statistical modeling techniques based on the relationship of the Policy Action Areas to life expectancy at birth. Low percentile scores reflect unhealthy conditions. The Healthy Places Index was used to identify priority populations as described above. The Healthy Places Index is useful in providing both big picture and localized insights into community health.

The tool was supplemented with additional information from **alternative** data sources as noted, for indicators that are not included in the Healthy Places Index.

- **U.S. Census, 2015-2019 American Community Survey (ACS)** presents demographic data by census tract and was used to supplement the Healthy Places Index percentile score. U.S. Census data was used to identify the percentage of the Huntington Park population that corresponds to each higher sensitivity group.
- **Cal-Adapt** is an online tool that presents historic and modeled projections based on 10 different global climate models. The tool was developed and is maintained by the University of California Berkeley with oversight from the California Energy Commission (CEC). This tool is used to present projection data related to minimum and maximum temperature, precipitation, extreme heat, warm nights, drought, and wildfire.
- **California's Fourth Climate Change Assessment** was developed by the CEC and other State of California coordinating agencies to present up-to-date climate science, projections and potential impacts associated with climate change. The CEC and coordinating agencies developed nine regional reports to provide regional-scale climate information to support local planning and action. The Los Angeles Region Summary Report (2018) presents an overview of climate science, regional projections, specific strategies to adapt to climate impacts, and key research gaps needed to spur additional progress on safeguarding the Los Angeles Region from climate change. The Los Angeles Region Summary Report was used to understand regional changes that may affect Huntington Park both directly and indirectly.
- **California Heat Assessment Tool (CHAT)** is an online mapping tool funded by the California Natural Resources Agency as part of California's fourth state climate change assessment to help state and local public health officials understand how heat vulnerability will change with increasing temperatures due to climate change. CHAT uses historical and projected daily maximum and minimum temperature, humidity, and emergency room visit data along with population and environmental characteristics to assign census tracts with heat vulnerability scores and to project the frequency and length of Heat Health Events over the course of the century for two climate scenarios (RCP 8.5 and RCP 4.5). A Heat Health Event (HHE) is any heat event that generates public health impacts, regardless of the absolute temperature.
- **Tree Equity Score** is a mapping tool created by the non-profit organization, American Forests, using tree canopy data from Earth Define. Trees provide numerous environmental and health benefits, including improved air quality, shade, and ambient cooling. Trees are often distributed unequally throughout the neighborhoods in cities. Tree Equity Score is intended to help identify census tracts that could benefit from additional tree planting the most and to estimate the benefits of tree planting to make the case for allocating the resources needed to do so. Tree Equity Scores are based on how much tree canopy and surface temperature align with income, employment, race, age and health factors. Scores are meant to indicate whether there are enough trees in specific neighborhoods or municipalities for everyone to experience the health, economic and climate benefits that trees provide.
- **City of Huntington Park Natural Hazard Mitigation Plan** contains a series of proposed actions that align with the General Plan, Capital Improvement Plans, and City Building & Safety Codes. Some of these proposed action items include enhancing debris management and building safety measures for stormwater flooding. The plan also mentions the improvement

of City water systems, enhancing utility and communications systems for emergency services, and conducting community outreach to educate about natural hazards.

Data Limitations

The limitations of this report and analysis stem from gaps in data availability and completeness of data methods. Census data can miss portions of the population (e.g., individuals experiencing homelessness, undocumented individuals) and general demographic information may not fully identify the full extent of populations at increased risk from climate change impacts (Census Bureau 2022; Warren 2022). Federal Emergency Management Agency (FEMA) 100-year and 500-year flood plains do not account for climate change projections, zones are instead based on historical information. Extrapolating air quality hazard exposure data in the context of climate change is difficult and the estimates of exposure to these hazards are likely to be underestimated.

The data presented in **Cal-Adapt** tools are projections, or estimates, of future climate. The limitation in these projections is that the long-term behavior of the atmosphere is expressed in averages – for example, average annual temperature, average monthly rainfall, or average water equivalent of mountain snowpack at a given time of year. The averages discussed often downplay the extremes by which daily weather events occur and when presented as an average, only show moderate changes within the climate. What is often lost in averages is that the frequency of extremes, like atmospheric rivers, may increase while low-moderate intensity weather events decrease through the end of the century. In instances of modeled precipitation projections, it maintains an average similar to historic levels which does not account for anticipated fluctuations in extremes (CEC 2021).

2 Exposure to Climate Hazards

Climate change is a global phenomenon that can impact local health, natural resources, infrastructure, emergency response, and many other aspects of society. There are several climate drivers that impact climate change. The primary driver of climate change is increased GHGs in the atmosphere due to human activity. Future projections of climate and climate hazards are dependent on both location and the trajectory of global GHG emissions over the time period considered. The Cal-Adapt tool provides climate data from global scale models that have been localized (downscaled) to 3.7 mile by 3.7-mile grids (CEC 2021). The data in Cal-Adapt is combined with information from the California Fourth Climate Change Assessment to model future changes in specific types of hazards within this assessment. This report discusses Huntington Park climate projections and impacts as part of California's Los Angeles Region, as detailed in the California Fourth Climate Change Assessment Los Angeles Region Report. Projections throughout this section are outlined by two separate GHG emissions scenarios referred to as Representative Concentration Pathways (RCP) that describe potential trajectories of global GHG emissions (CEC 2021).

- RCP 4.5 is a medium emissions scenario in which global GHG emissions peak by the year 2040 and then decline.
- RCP 8.5 is a high emissions scenario in which global GHG emissions continue to rise through the end of the 21st century.

Additionally, projections are forecasted to mid-century (2035-2064) and end-century (2070-2099) as 30-year averages to be compared to a modeled historical baseline (1961-1990) (CEC 2021).

This section presents information on temperature and precipitation, which are characterized as climate indicators. The following section then provides information on projected changes to natural hazards of extreme heat, drought, poor air quality, and stormwater flooding resulting from changes to climate indicators.

2.1 Climate Indicators

The climate indicators most relevant to Huntington Park are temperature and precipitation. The following section summarizes projected changes to these climate indicators. All projections are pulled from the Cal-Adapt Local Climate Change Snapshot tool (CEC 2021, CEC 2018).

Temperature

Huntington Park has an average maximum temperature of 74.8°F and an average minimum temperature of 55.2°F. Average maximum temperatures are expected to increase in Huntington Park by approximately 3.6°F (RCP 4.5) to 4.4°F (RCP 8.5) by the mid-century and 4.6°F (RCP 4.5) and 7.6°F (RCP 8.5) by end-century. Average minimum temperature are expected to increase in the city by approximately 3.4°F (RCP 4.5) and 4.3°F (RCP 8.5) by mid-century and 4.4°F (RCP 4.5) to 7.5°F (RCP 8.5) by end-century (CEC 2021). Temperature increases affect various climate related hazards including extreme heat and warm nights, drought, and air quality, further described in the Hazards section.

Precipitation

Climate projections show that there will be more frequent and longer dry periods punctuated by increased precipitation intensity of the largest storms or wet periods (CEC 2018). Projections for Huntington Park predict that annual precipitation totals will remain relatively stable, increasing slightly by up to 0.3 inches by end-century. However, as already observed in recent decades, precipitation changes are largely observed as more extreme variability with intense wet years followed by extreme drought (CEC 2018). Climate change is projected to increase the intensity of extreme precipitation events in the Los Angeles region (CEC 2018). Maximum 1-day precipitation values are projected to increase by approximately 0.1 inches by mid-century and between 0.2 inches and 0.3 inches by end-century (CEC 2021). These changes in extremes will produce little net change in precipitation totals as the wetter storms and drier dry periods are summed into the precipitation total, but the individual precipitation events and general conditions are expected to be more extreme and alter the risk landscape for related climate hazards (CEC 2018). In Huntington Park precipitation changes are expected to affect drought, stormwater flooding, and air quality.

2.2 Hazards

This section outlines projected changes for the following climate hazards:

Extreme Heat and Warm Nights

Drought

Stormwater Flooding

Air Quality

Extreme Heat and Warm Nights

In Huntington Park an extreme heat day is defined any day when the maximum temperature exceeds 96.1°F. Historically, between 1961-1990, the city experienced an average of two extreme heat days per year. By mid-century the average number of extreme heat days is expected to increase to a total of 7 (RCP 4.5) to 9 (RCP 8.5) days. The average number of extreme heat days is expected to increase to a total of 10 (RCP 4.5) to 21 (RCP 8.5) days per year by end of century. In addition to increasing frequency of extreme heat days, Huntington Park is also expected to experience a higher number of warm nights.

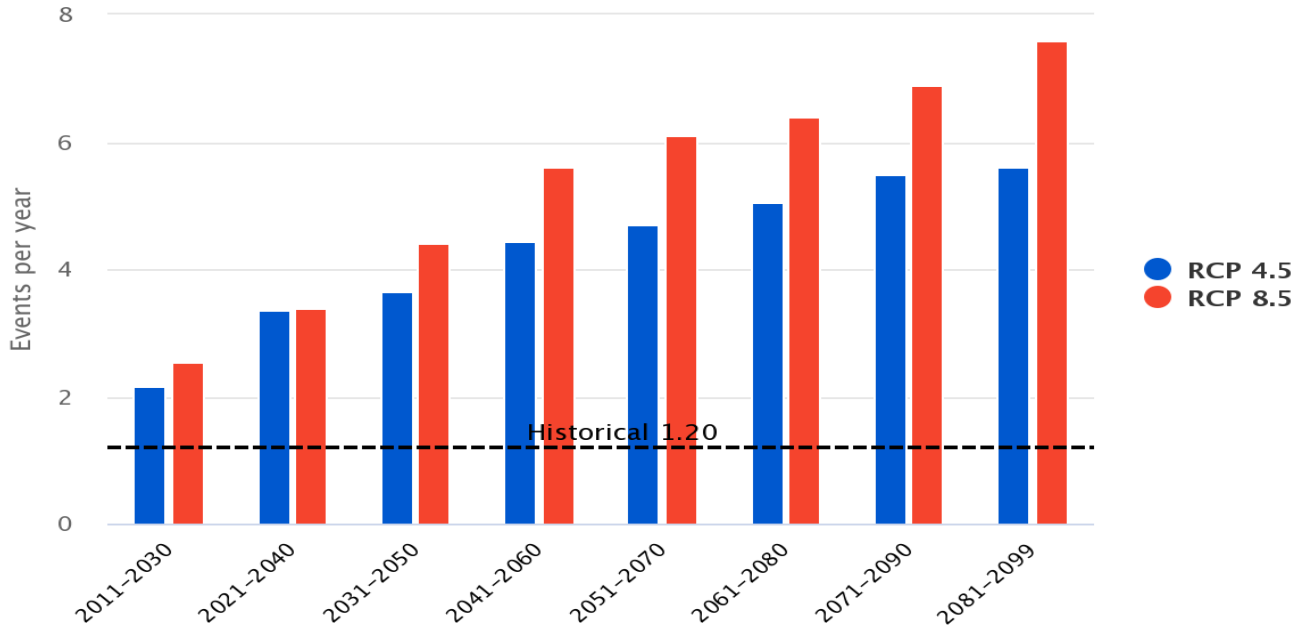
Warm nights affect the body's ability to cool down and recover from heat stress during extreme heat periods exacerbating heat-related health problems including, heat exhaustion, dehydration and cardiovascular stress, especially for sensitive populations. In Huntington Park, a warm night is defined as nights when the daily minimum temperature is above a threshold temperature of 70.3°F (CEC 2021). Between 1961-1990, the city experienced an average of five warm nights per year. Mid-century projections range from an average increase of 16 (RCP 4.5) to 24 (RCP 8.5) additional warm nights annually. End-of-century projections range from 25 (RCP 4.5) to 63 (RCP 8.5) additional warm nights annually.

Urban Heat Island (UHI) is a term that refers to developed areas that are hotter than the surrounding landscape primarily due to the use of building materials and surfaces that absorb and re-radiate heat (like roofs and pavements), as well as a lack of vegetation, particularly trees. The UHI effect causes people in cities to have higher heat exposure than residents in less densely developed areas. Within urban landscapes, neighborhoods with more impermeable and dark colored surfaces, and fewer trees, parks, and water features, have greater heat exposure and heat related risk than urban communities with more green space and reflective surfaces. These differences in development patterns typically correspond with income and demographic disparities across the urban environment. Low-income communities and many communities of color across Los Angeles County are the most impacted by the urban heat island effect (LA CDPH 2021). UHI will likely compound the impact and risk of extreme heat days and higher average temperatures resulting from climate change. In some locations, the effect could be twice as strong as the impact of global warming (Huang et al. 2019).

The California Heat Assessment Tool (CHAT) projects increases in heat heath events (HHE) which are heat events such as heat waves that have public health impacts, over the course of the

century for census block groups across California. CHAT projects similar increases in HHEs for all the census block groups in Huntington Park, so an HHE frequency projection chart is included from only one of the census block groups (block # 6037532603) in Figure 2, below. The projections are tailored to estimate the number of heat events with public health impacts for priority populations with experience higher heat-sensitivity than the general population, including those with asthma, the elderly, and children. The red bars indicate the projected number of HHEs in the RCP 8.5 "business-as-usual", or high GHG emissions scenario, and the blue bars indicate the projected number of HHEs under the more moderate RCP 4.5 scenario. Under both scenarios the number of HHEs are expected to increase by several times the historical average, shown as a dotted black line. These projections show that public health is likely to be impacted for all community members in Huntington Park, especially those with higher sensitivity to heat. The projections also show the importance of planning to minimize the public health impacts from increasingly frequent HHEs over the course of the century.

Figure 2 Projected Heat Health Events for Higher-risk Populations in a Selected Census Tract in Huntington Park



Source: California Heat Assessment Tool

Historical Causes of Inequitable Heat Exposure

After the Great Depression the U.S. Government undertook numerous projects to stimulate the economy, expand housing stock, and evaluate the riskiness of home mortgages. The Home Owners' Loan Corporation was established in 1933 with the passage of the Home Owners' Loan Act, with the key task of refinancing mortgages and slowing down the rate of foreclosures (FHFA). During the 1930's the HOLC created detailed maps of urban areas across the United States. HOLC maps documented the perceived risk of lending and determined the lending practices of banks and other mortgage lenders administering the federal loans.

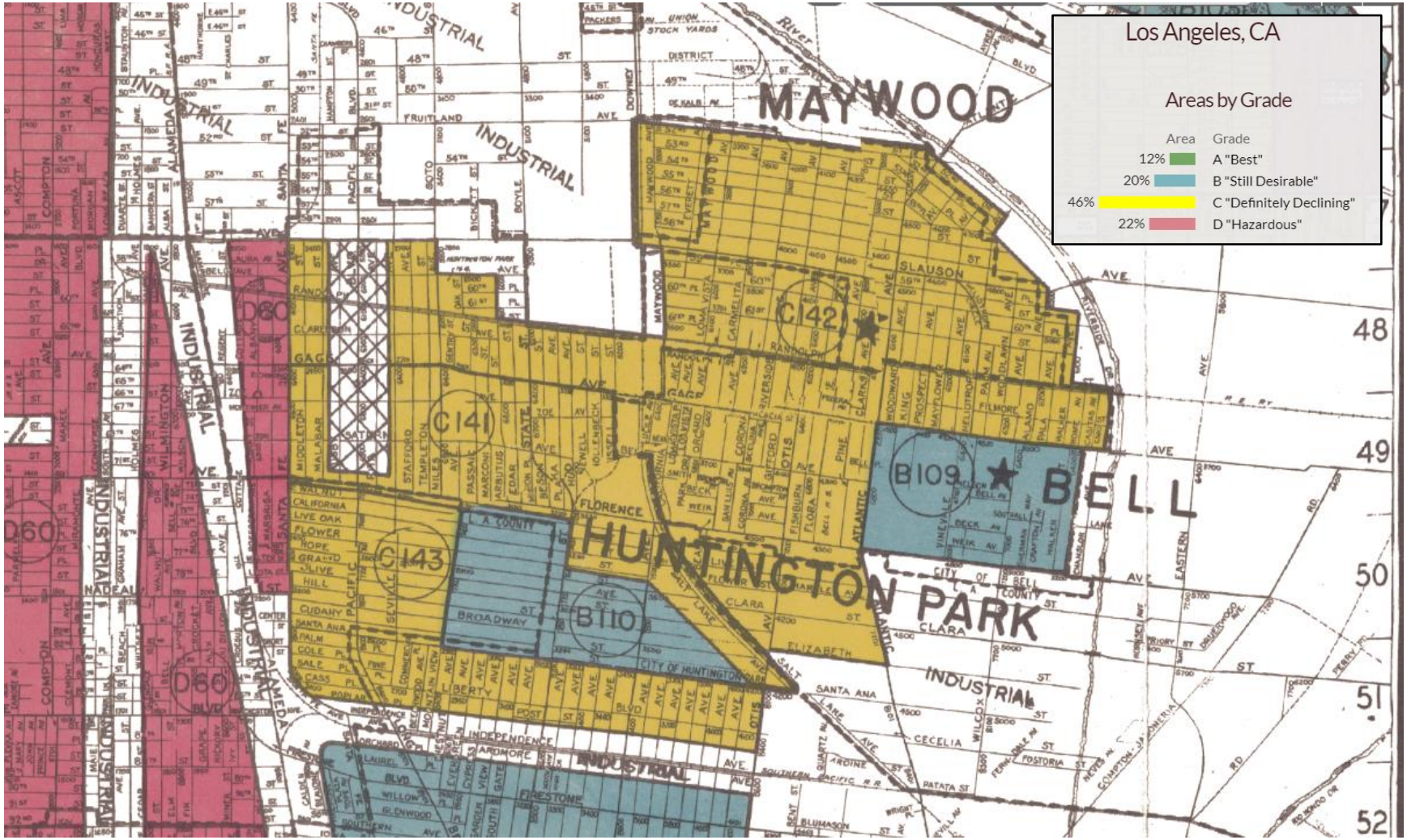
These maps graded neighborhoods on a scale from "A" through "D" and the grade correlated with color coding on the maps of green through red, hence the term "redlining". A-rated neighborhoods, colored green on the maps, were classified as the most desirable, and least risky for lenders. D-rated neighborhoods, colored red on the maps, were classified as the highest risk neighborhoods, and families in these neighborhoods were typically denied mortgages and their mortgages were often not federally insured if they were granted one (Rothstein). The HOLC neighborhood assessments explicitly used racial makeup of residents as a determinant of neighborhood quality and mortgage risk (Rothstein). Neighborhood descriptions included references to the racial make-up of a neighborhood, in particular the homogeneity, percentage of immigrants and whether they were considered "subversive", and the number of black, Mexican, and residents of various non-white ethnic groups (Nelson et al.; Rothstein). In the HOLC assessments, racially integrated neighborhoods and neighborhoods with higher numbers of immigrants and people of color were considered higher risk and perceived as destined to deteriorate in value (Nelson et al.; Rothstein). This led to disinvestment in low-rated areas of cities and a loss of wealth building for generations of American families who were unable to purchase homes (Rothstein). This practice of racial exclusion from homeownership allowed white Americans to accumulate wealth through government backed homeownership while minority communities were excluded and marginalized (Rothstein). Historic disinvestment and constraints on loans to real estate developers tied to racial restrictions resulted in differences in the quality of housing, amount of housing, and the amount of green space and other amenities that were built in different neighborhoods based on the income and racial demographics of potential residents (Nelson et al.; Rothstein).

Many of these development differences still largely persist to this day. Recent research has shown that neighborhoods that HOLC rated as a "D" level of risk are still predominantly low-to-moderate income and communities of color, while "A" neighborhoods are still predominantly white and above average income. Previously red-lined neighborhoods are also correlated with more impervious paved surfaces, fewer trees and green spaces, and higher average temperatures than the non-redlined, historically white neighborhoods in the same city (Hoffman et al.). Another study assessing 175 of the largest urbanized areas in the United States found that the average person of color lives in a census tract with greater than 2 degrees Celsius higher urban heat island intensity compared to non-Hispanic whites (Hsu et al.). A few degrees of temperature difference, and especially warmer temperatures at night, can translate into an appreciably increased risk of heat stress. This means that communities that faced historical housing discrimination often bear a greater health burden as excessive heat events become more frequent and severe due to climate change. This disparate heat exposure risk is known as heat inequity.

Huntington Park was included in the 1939 Los Angeles and Vicinity Residential Security Map produced by HOLC and the Federal Home Loan Bank Board. See Figure 3 below for a close up of the

Huntington Park area in the HOLC map. Green colored areas represent neighborhoods that were graded “A – Best”. No neighborhoods in Huntington Park received an A grade. Most of Huntington Park was graded “C – definitely declining”, colored yellow on the map, the reasoning provided for this grade was the presence of lower-income and working-class residents, powerlines and industrial uses, and mixed quality of housing. The western portion of Huntington Park was rated at the “D – Hazardous” level, colored red on the map, due to the presence of low-income residents, range of building quality, heterogenous population, and increasing numbers of African American and Mexican residents. The southeast portion of the city bordering Walnut Park was graded “B – Still Desirable” due to deed restrictions that limited development to single family housing and prevented non-white families from purchasing homes. This area was developed with federal financing and graded favorably on the mortgage risk map as a result of the good quality homes this financing afforded and the racial segregation achieved through racially restrictive deeds.

Figure 3 Close Up of Home Owners' Loan Corporation (HOLC) Neighborhood Grading Map of Los Angeles circa 1939



Source: Nelson et al. University of Richmond. Mapping Inequality: Redlining in New Deal America.

Tree Equity Score

The number and distribution of trees in cities in the United States, often reflects differences in race and income across city landscapes. While the amount of paved and impermeable surfaces and lack of water features and green spaces can increase the impact of temperature increases from climate change, adding more green spaces and especially trees, can have the opposite effect. Trees provide a number of critical services to cities and residents including shade, improved air quality, increased rain interception and reduced stormwater runoff, and in great enough numbers trees can cool ambient temperatures and reduce the impact of climate change and extreme heat on public health.

Treeequityscore.org analyzes a range of neighborhood characteristics including the existing tree canopy, population density, income, employment, surface temperature, racial demographics, age distributions, and health metrics to create a single tree equity score between 0 and 100. A score of 100 would indicate that a neighborhood has achieved tree equity.

Of the 43 census block groups included in the Tree Equity Score Municipality Report for Huntington Park 11 have a tree equity score below 65. The remaining block groups have a score between 65-89. No census block groups have a tree equity score of 90 or above.. It is estimated that 6,818 trees would need to be planted in the 11 block groups with the lowest scores to get all census block groups to a tree equity score of at least 65. This would increase the total tree canopy of Huntington Park by 4.6% and result in numerous other annual benefits including those listed below.

Estimated Annual Service Benefits from Increasing Huntington Park's Tree Canopy by 4.6% (adding 6,818 trees):

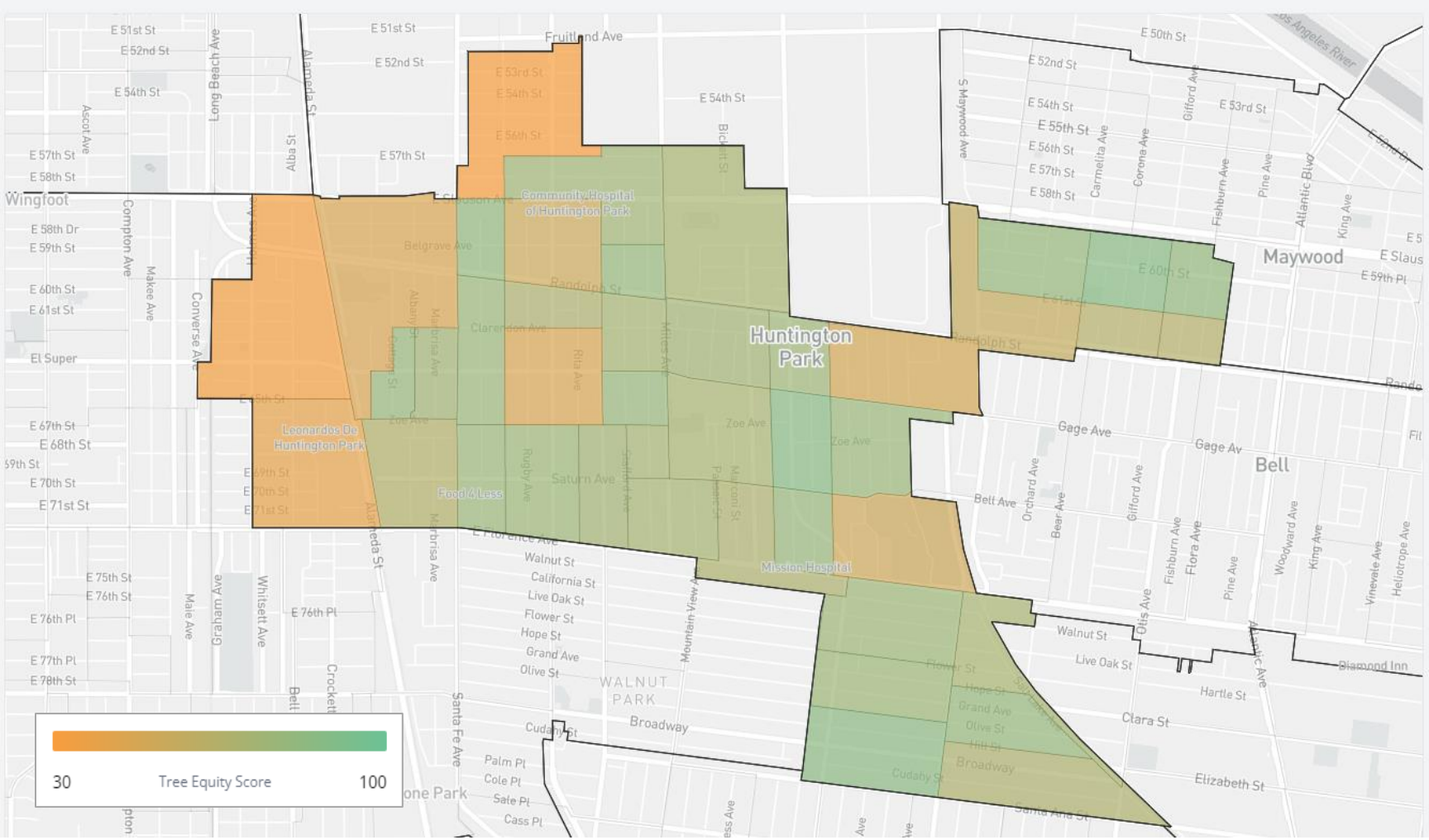
- Carbon Sequestered: 147.9 tons.
- Runoff Avoided: 5,257 m^3.
- Ozone Reduced: 3.6 tons.
- Particulate Matter Pollution Reduced (PM 10 and PM2.5): 1 ton.
- Other pollutants reduced: <1 ton.

Comparing the HOLC map in Figure 3 and the Tree Equity Score map in Figure 4 can shed some light on the legacy of redlining and historic disinvestment on current levels of heat risk throughout the city. In line with the research referenced above, the western portion of Huntington Park that had "D" graded neighborhoods continues to have fewer trees, and lower tree equity scores relative to the rest of the city, the southeastern portion of the city that had been graded "B" has some of the highest tree equity scores in the city, and the historically "C" graded areas vary with a range of tree equity scores, as illustrated in Figure 4 showing current tree equity scores by census block in Huntington Park.

Compounding Risks: Housing and Heat Related Illness

Housing and socio-economic factors can intersect in ways that compound the risks of climate impacts such as extreme heat events. When housing is in short supply and unaffordable this can lead to overcrowding, especially for lower-income communities. Aging, overcrowded, and poorly insulated housing can contribute to risk from heat related illness, which can in turn lead to hospital visits and even increased mortality. If the electricity grid is strained during a heat wave and there are power outages, this can further increase the risk of heat related illnesses if access to adaptations such as air conditioning, fans, and refrigeration are lost.

Figure 4 Municipality Tree Equity Score Map for Huntington Park



Source: Tree Equity Score Municipality Report for Huntington Park.

A study published in 2022 found that housing age, housing crowding ratio, and roof condition were found to be correlated with the risk of heat-related illness indexes and can predict the risk of heat-related emergency department visits and heat-related mortality on a state level. This analysis indicates that housing quality and affordability as characterized by age, crowding, and roof condition can impact heat related illness risk (Hu et al. 2022).

Huntington Park is one of the densest cities in the United States, and overcrowding is prevalent throughout the city with 60% of renter-occupied households and 21% of owner-occupied households being overcrowded. Of those, 20% of the renter-occupied households and 4% of the owner-occupied households are severely overcrowded. Overcrowding is more common in Huntington Park than in the surrounding region, indicating a lack of family-sized housing sufficient to meet demand. The California 2020 Census Hard-to-Count index rated all of Huntington Park as falling within the highest difficulty level for accurately enumerating population. The variables most cited for contributing to difficulty in getting accurate counts were renter occupied units, crowded units, foreign born population and limited English speaking population (CA Census 2020). The large numbers of undocumented immigrants, Spanish speakers, and crowded housing conditions likely contributed to an undercount of the true population of Huntington Park.

Housing affordability issues also impact Huntington Park residents. According to the U.S. Department of Housing and Urban Development ("HUD") and the California Department of Housing and Community Development ("HCD"), housing is considered "affordable" if monthly housing costs are no more than 30% of a household's gross income. In Huntington Park, 62.9% of renter households spend 30% or more of their income on housing cost, compared to 55.3% regionally, and home sale prices are also increasing at a faster rate in Huntington Park compared to the larger region (Huntington Park 2021-2029 Housing Element Update).

The age of housing stock can indicate housing quality and the likely need for rehabilitation work that can impact public health, including remediation of lead-based paint and maintenance or replacement of major elements such as roofing. 78% of the housing stock in Huntington Park was built prior to 1980, and 26.2% of those homes, the largest proportion, were constructed prior to 1939 (Huntington Park 2021-2029 Housing Element Update). Typically housing over 30 years of age is likely to need rehabilitation work to major elements of the structure. Given the age of the housing stock in the city, a large majority of Huntington Park's housing stock is in substandard condition, with approximately 12,395 units citywide estimated to need some level of rehabilitation and/or may require replacement (Huntington Park 2021-2029 Housing Element Update). Considering the study mentioned above it is possible that the age, availability, cost-burden and crowding conditions of Huntington Park's Housing may contribute to increased risk of heat-related illnesses, especially as climate change contributes to more frequent extreme heat events.

A separate study analyzed exposure and vulnerability to heat by housing type and location using census tract level data combined with housing characteristics, climate projections, and an index of adaptive capacity and sensitivity to heat. The analysis revealed that subsidized housing in California simultaneously has the most sensitive populations and barriers to adaptation while being disproportionately located in the hottest census tracts (C. J. Gabbe et al. 2020). Specifically, while 8% of California's total number of housing units are located in tracts with high heat exposure and high sensitivity populations (high-high tracts), these high-high tracts contain 16% of public housing units, 14% of Low-Income Housing

Tax Credit units, and 10% of Section 8 Housing Choice Vouchers (C. J. Gabbe et al. 2020).

Taken together these studies show that housing policy should be considered an essential public health and safety mechanism for mitigating climate change-exacerbated health conditions in Huntington Park. Policies and programs should aim to address heat exposure and adaptation for subsidized housing, high sensitivity populations, and seek to increase housing availability and quality, especially in the hottest parts of the community, in order to help reduce health impacts from extreme heat.

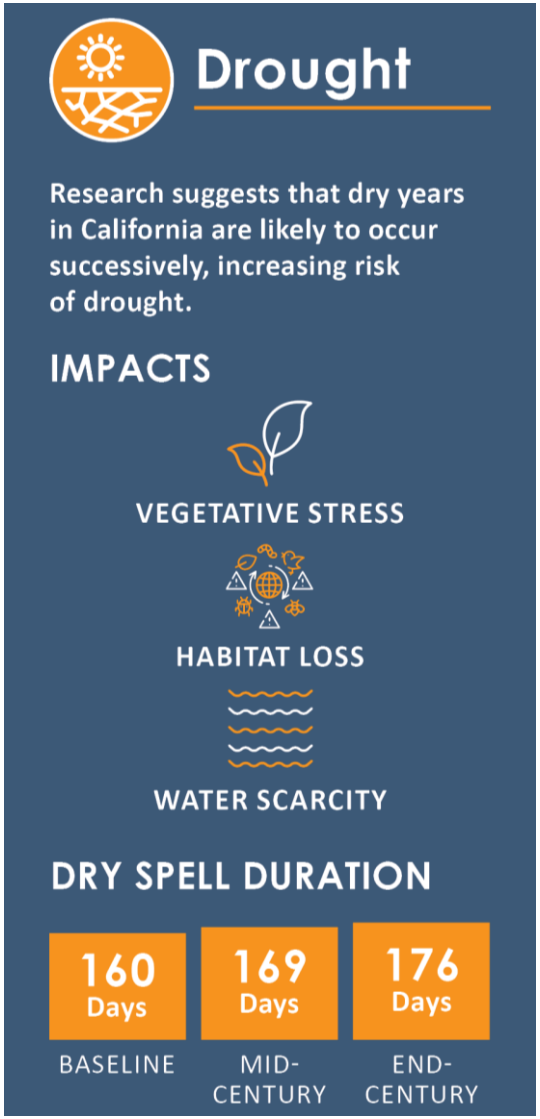
Drought

Climate change will increase the likelihood that low-precipitation years will coincide with above-average temperature years contributing to drought conditions. While the overall average precipitation for Huntington Park is not anticipated to change dramatically by mid- or end-century, this does not reflect a lack of change in risk of drought. Increasing variability of precipitation events is expected to lead to year-to-year precipitation becoming more volatile and the number of dry years in a row increasing (CEC 2018).

The duration of dry spells is projected to vary based on emissions scenario. Like patterns in precipitation, some of the annual variability is obscured within 30-year average. Despite this, the clear trend is for the maximum length of dry spells to increase through the end of century (CEC 2021).

- The Huntington 30-year modeled historical average for maximum length dry spells is 160 days.
- Mid-century projections range between an 8 day (RCP 4.5) and a 9 day (RCP 8.5) increase in maximum length of a dry spell, for a range of 168 to 169 days annually.
- End-century projections range between a 7 day (RCP 4.5) and a 16 day (RCP 8.5) increase in maximum length of dry spell, for a range of 167 to 176 days annually.

Drought can impact natural resources leading to water-stressed vegetation and habitat loss, while water scarcity may necessitate water use restrictions, and sensitive populations may be at greater risk of heat stress and dehydration (CEC 2018).



Stormwater Flooding

When an influx of stormwater exceeds a drainage system's capacity to infiltrate water into the soil or to carry it away, localized stormwater flooding can occur. Urban landscapes tend to be built with impermeable surfaces that do not allow much water to infiltrate the ground and this increases the amount of runoff that must be channeled in storm drainage systems and carried elsewhere. Most urban drainage infrastructure was not built to manage stormwater flows from the increased precipitation events that are occurring and will occur more frequently with climate change and can be costly to retrofit. As a result, the costs and impact of urban flooding are expected to increase as precipitation patterns become more extreme due to climate change (NASEM 2019).

Climate change may cause areas throughout Huntington Park to experience more frequent stormwater flooding. Stormwater systems may be overwhelmed more frequently as more extreme rain events occur, causing localized flooding which could impact properties and leave roads temporarily unusable. Areas with high amounts of impermeable surfaces and those adjacent to drainage systems are prone to stormwater flooding during periods of heavy rainfall.

Flooding impacts directly create physical damage from inundation (Hall et. al 2018). Flooding can also lead to cascading risks due to loss of power, wastewater management issues, pollution carried by stormwater including hazardous materials, and overwhelm storm drainage infrastructure, exacerbating public health concerns.

Air Quality

Local Conditions Impacting Air Quality

The City of Huntington Park is in the South Coast Air Basin (SCAB or Basin), which is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, and the San Diego County line to the south. The air quality in the SCAB is primarily influenced by a wide range of emissions sources – such as dense population centers, heavy vehicular traffic, industry, and weather. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific Ocean, resulting in light average wind speeds. The SCAB experiences a persistent temperature inversion (increasing temperature with increasing altitude) because of the Pacific high-pressure zone. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations in the SCAB. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino counties.

Ambient Air Quality Measurements

Air quality monitoring stations throughout the region monitor concentrations of air pollutants and determine whether ambient air quality meets the California and federal standards for various air pollutants. From 2019-2021 federal and State 8-hour ozone standards were exceeded, the State worst hour ozone standard was exceeded in 2020 and 2021, and the federal worst hour ozone standard was exceeded in 2020. In addition, the State standard for particulate matter of 10 microns in size was exceeded every year from 2019 to 2021 and the federal standard for particulate matter of 2.5 microns in size was exceeded each year from 2019 to 2021.

Air Quality and Climate Change

Poor air quality is associated with increased health impacts most frequently from inhalation pollutants. Higher temperatures are conducive to air pollution formation,

and rising temperatures could therefore result in worsened air quality. Worsening air quality due to climate change can create respiratory issues for sensitive populations and impact indoor environments that do not have adequate air filtration systems. There are several types of air quality decline sources found below:

- **Dust.** Increased temperature leads to dry, dusty conditions also associated with drought (Hall et al. 2018). Increases in dust conditions increases exposure to particulate matter, including PM_{10} (particulates less than 10 microns in diameter). PM_{10} can cause increased respiratory disease, lung damage, cancer, premature death, reduced visibility, surface soiling. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases (CARB 2022).
- **Smog.** Increases in ambient temperature can lead to higher rates of smog also referred to as ozone. Groups most sensitive to O_3 include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors (USEPA 2021). Depending on the level of exposure, ozone can cause coughing and a sore or scratch throat; make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath; inflame and damage the airways; make the lungs more susceptible to infection; and aggravate lung diseases such as asthma, emphysema, and chronic bronchitis. Ground-level ozone specifically will be experienced at higher rates leading to raised cardiovascular and respiratory morbidity and mortality rates (CDPH 2014). Ground-level ozone has also been shown to have particularly disproportionate adverse impacts on populations experiencing homelessness and lower median income (PNAS 2021). Huntington Park will experience increases in ozone concentrations in parallel to temperature increases.
- **Fewer Natural Filtrations.** Precipitation variability and long periods of dry spells lead to less reliable air quality for the entire region. Moisture in the air can filter pollutants and provide for overall improved conditions. Urban vegetation can directly affect air quality. Trees remove gaseous air pollution. Large healthy trees remove more pollution than younger, smaller trees (USDA Forest Service, 2002). Rising temperatures could increase mortality for large healthy trees which would reduce the ability for urban vegetation to reduce air pollutants, therefore increasing pollutant exposure to sensitive populations.
- **Wildfire Smoke.** Temperature, severe wildfire conditions, and the area burned by wildfires have all increased throughout the state and are expected to continue to increase. Higher temperatures accompanied by an increase in the incidence and extent of large wildfires will lead to increased wildfire smoke and associated toxins and air pollution (Hall et al. 2018). Wildfire smoke is comprised of a mixture of gaseous pollutants, hazardous air pollutants, water vapor, and particle pollution (fine airborne particulate matter – $PM_{2.5}$) with particle pollution being the main component and the principal threat to public health (USEPA 2021). Smoke from wildfires is known to contain a large abundance of $PM_{2.5}$ and are estimated to contribute to approximately 18 percent of the total $PM_{2.5}$ atmospheric emissions in the US (Liu 2016). On days where $PM_{2.5}$ exceeds regulatory standards an average of 71.3 percent of the total $PM_{2.5}$ emissions are attributable to wildfires (Liu 2016). Short-term exposures to $PM_{2.5}$ (up to 24-hours duration) has been

associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases (CARB 2022).

Compounding Risks: Heat and Smog during a Recent Heat Wave

Central and Southern California experienced a heat wave with numerous extreme heat days in early September of 2022. In Los Angeles there was a public health advisory for August 31st through September 8th for both heat and ozone. During this period there were 8 days out of 9 where the temperature was 96 degrees or above in Huntington Park, qualifying as extreme heat days. As discussed in the section on extreme heat and warm nights, heat presents a major health risk to community members, especially to those with higher sensitivity to heat. Air quality monitoring during the heatwave showed ozone levels increased alongside temperature throughout the day, peaking around noon. State ozone standards were exceeded during these peak times on three of the days (September 3rd, 4th, and 5th). Ozone, or smog, can cause negative health impacts from minor irritation to exacerbation of existing health and lung conditions that can be life threatening. Since higher temperatures increase ground level ozone, these health risks are compounded during extreme heat events, particularly when local conditions such as low wind speed, prevent the dispersion of pollution.

3 Community Populations, Assets, and Services at Risk

Populations and community assets are affected by climate change depending on their sensitivity to climate hazards. This section identifies priority populations and assets in Huntington Park. Potential impacts from the climate hazards of concern on priority populations and assets are presented in the Vulnerability Analysis section. Assets are grouped in the following manner:

- Priority Populations
- Natural and Recreational Resources
- Buildings and Facilities
- Infrastructure and Critical Services

3.1 Priority Populations

While all people in a community will experience climate change, some may be more affected than others. For example, older adults and young children are at higher risk for experiencing a heat related illness during an extreme heat event. Several factors influence sensitivity to climate hazards including an individual's health, age, ability, experience of structural inequality, inequities in access to health care, economic opportunity, education and other resources, and inequities found in basic needs and exposure to environmental stressors (Cal OES 2020). These higher-risk populations should be prioritized when considering climate impacts, adopting climate resilience policies, and planning adaptation projects.

In addition to facing greater exposure to and risk from climate change impacts, priority populations often have fewer resources to adapt and recover from climate change impacts. Returning to the example of extreme heat, the health risks of extreme heat events are often compounded due to the enhanced formation of air pollutants at ground level when temperatures are higher, in addition to the health risks from the high temperatures. Community members experiencing homelessness have much higher exposure to both the elevated temperatures and reduced air quality and are less likely to have the resources to adapt through access to air conditioning, air filtration, and medical attention should health issues occur. Urban heat island effect amplifies increased nighttime temperatures, which limits the ability of people to cool down and recover before the heat of the next day, thereby adding to the risk of illness and fatalities, especially for populations without access to air conditioning and those living in overcrowded housing.

These kinds of intersections between population characteristics and climate hazard exposure are important for understanding where there is increased risk from climate change in the community. Understanding where climate vulnerability is greater can help to prioritize adaptive capacity building and resilience planning efforts.

Following guidance from the SoCal APG, populations that will likely experience disproportionate impacts from climate change were identified for Huntington Park (SCAG 2020). Huntington Park has several higher risk populations listed in Table 1 below. Highlighted rows indicate a higher proportion of populations present in Huntington Park than in the statewide average, where comparable state statistics are available.

Table 3 Priority Populations in Huntington Park

Population	Population Description	Percentage of Population or Households,	State Percentage or Population or Household
Individuals with education attainment less than 4 years of college	Percent of people over age 25 without a bachelor's education or higher	**92.2%**	65.3%
Renters	Housing units that are renter occupied	**73%**	45%
Non-white Communities	All individuals that do not identify as white	**99%**	63%
Older adults	Individuals 65 years or older	9%	14%
Individuals with Asthma	Age-adjusted rate of emergency department visits for asthma	10%	NA
Low Income	Individuals below the federal poverty level	**56%**	12.3%
Individuals with no health insurance	Individuals aged 18 to 64 years old currently uninsured	**18%**	7%
Households without broadband internet	Households without access to broadband internet.	**18%**	10%
Individuals with disabilities	Individuals with access and functional needs (physical and mental)	8%	10%
Children	Individuals 5 years and younger	**8%**	6%
Miliary Veterans	Individuals who have served but are not currently serving in the US Armed Forces	1%	5%
Unemployed	Percentage of population aged 25-64 who are unemployed	**7%**	4%
Households without a computer	Households without access to a computer.	**11%**	6%
Linguistically Isolated	Households with individuals who are non or limited English-speaking	**43%**	17%
Outdoor Workers	Individuals who are employed, 16 and older, and work outdoors	6%	NA
Isolated Individuals	Households without access to a vehicle	**13%**	7%
People experiencing homelessness	Individuals who currently lack fixed, regular, and adequate housing	0.4%	0.4%
Single female head of household	Female householder with children under 18-year-old and no spouse/partner present	**10%**	5%
Individuals with Cardiovascular Disease	Age-adjusted rate of emergency department visits for heart attacks per 10,000.	22%	NA
Overcrowded Renter-Occupied Households	Renter-occupied households with more than one person per room	**60%**	13%
Overcrowded Owner-Occupied Households	Owner-occupied households with more than one person per room	**21%**	4%
Cost-burdened Households	Households spending more than 30% of income on housing costs	**63%**	55%*

*Regional statistic

Sources: The percentages used in this table were acquired from the California Healthy Places Index 3.0, U.S. Census, 2015-2019 American Community Survey (ACS), California Health and Human Services Data Portal, Huntington Park Housing Element, and SCAG point in time count.

Additional Sensitive Populations

In addition to the populations listed in the table above, the SoCal APG also identifies the following groups as generally having higher risk or sensitivity to climate impacts:

- Tribal and indigenous communities
- Visitors and seasonal residents
- Students
- Incarcerated individuals
- Undocumented individuals

Huntington Park is not known or reported to have sizeable populations of visitors and seasonal residents, or tribal and indigenous community members, so these population categories were excluded from the table and impact analysis.

While not located near major colleges or universities there are 24 LAUSD operated public schools located in the City of Huntington Park and 39 schools that serve city residents.

When considering incarcerated individuals several factors were assessed. Huntington Park Police Department owns and operates a 22-bed city jail. In addition to this, the Healthy Places Index indicates that the 2017 incarceration rate for LA County was 4.41 incarcerated individuals per 1,000 residents, which is higher than 84.2 percent of other California counties. Incarceration and arrests are not distributed equally among communities within Los Angeles County. A research and mapping project conducted by UCLA averaged the arrests, days spent in jail, and cost of incarceration for all Los Angeles communities between 2012 through 2017, broken out by arresting department. Huntington Park was ranked 33 out of 244 communities for incarceration by the Los Angeles Police Department (LAPD), and 24 out of 244 for incarceration by the Los Angeles Sheriff's Department (LASD). The combined LAPD and LASD annual averages for Huntington Park during the study years were:

- Cost (annual average): $4,273,925
- Days in jail (annual average): 27,275
- Arrests (annual average): 2,322

From January 2010 through December of 2019, the LASD recorded 6,921 total bookings of Huntington Park residents in county jails, with total confinement time during that period totaling at least 764 years with a minimum cost of $38,156,198. Incarcerated individuals may not have their medical needs adequately met and have limited control over their environment while imprisoned including potentially overcrowded or inadequately cooled conditions, and institutional decision-making about evacuations (Cowan 2020). After incarceration, individuals often experience increased financial costs and decreased work opportunities which further decrease resilience to climate hazards for both the formerly incarcerated individual and their families (Carter et al.). Taken together these metrics justify including incarcerated individuals as one of the sensitive populations in the vulnerability assessment.

While attaining accurate statistics for the number of undocumented individuals in Huntington Park is not possible, the Migration Policy Institute (MPI) estimates that Los Angeles County was home to 951,000 unauthorized immigrants as of 2019. Though it is difficult to assess the exact number of undocumented individuals in the community this population is included in the analysis.

Grouping Populations

Priority populations were grouped based on potential exposure to climate hazards, access to resources to prepare, cope with, or recover from climate hazards, whether individuals face societal

disadvantages, or if individuals have heath conditions or health sensitivities that increase their risk from climate hazards. Often there are numerous interacting factors that impact a population's climate hazard risk; however, for the purpose of this assessment, they were grouped based on the sensitivity that increases their risk the most. Priority populations are grouped as outline below:

- **Individuals with High Outdoor Exposure.** Outdoor workers, and people experiencing homelessness.
- **Under-Resourced Individuals.** Low-income, unemployed, individuals with no health insurance, households without a computer, households without a broadband internet, renters, isolated individuals, individuals with educational attainment of less than 4 years of college, single female heads of household
- **Individuals Facing Societal Barriers.** Non-white communities, linguistically isolated individuals, incarcerated individuals, students, and undocumented individuals.
- **Individuals with Chronic Health Conditions or Health Related Sensitivities.** Children, individuals with asthma, and individuals with cardiovascular disease

3.2 Natural and Recreational Resources

Natural and recreational resources within Huntington Park as detailed in the Draft Resource Management Element of the unadopted 2030 General Plan include groundwater resources, parks (Chesley Park, Robert Keller Park, Freedom Park, Salt Lake Park, Senior Citizen Park, and Raul R. Perez Memorial Park), city bikeways, and street trees making up the urban forest. These various resources provide sources of community resilience and recreation to the city. The City currently provides 31 acres of total parkland space. According to the technical appendix to the newly adopted Environmental Justice Element, 13 percent of Huntington Park residents live further than a half mile away from a park and approximately 96 percent of residents live in areas with less than three acres of parks or open space per 1,000 residents. The statewide standard is five acres of park per 1,000 residents. For these reasons, all but two census tracts in Huntington Park are considered "critically underserved" according to the California Statewide Park Program. Because Huntington Park is a heavily urbanized city, there is limited available land left undeveloped within the planning area. Due to this development context, there are existing barriers to the creation of new parks and open space to serve the population. Existing park resources are spread throughout the city and face various levels of exposure to climate hazards.

3.3 Buildings and Facilities

Climate change is expected to amplify extreme weather and climate hazards in Huntington Park. A jurisdiction's vulnerability increases when buildings and facilities are not designed, operated, and/or maintained to function effectively under extreme weather conditions or can be damaged by extreme weather conditions. Due to the roles they play in supporting general community functioning and hazard response, the following City buildings and facilities would be particularly important to assess for climate change impacts: municipal buildings, educational facilities, hospitals, residential and commercial development, roadways and transportation facilities, active transportation routes, fire stations, and police stations. Some key buildings and facilities in Huntington Park include:

- City Hall: 6550 Miles Avenue, Huntington Park, CA 90255
- Field Services Department, Parks and Recreation Center
- Two LA County Fire Department fire stations:
  - Fire Station 164 (Battalion 13 HQ): 6301 S Santa Fe Avenue, Huntington Park 90255
  - Fire Station 165: 3255 Saturn Avenue, Huntington Park 90255
- Huntington Park Police Department: 6542 Miles Ave., Huntington Park, CA 90255
- Educational Facilities:
  - 24 schools operated by the Los Angeles Unified School District, located throughout Huntington Park.
  - LA County Public Library
- Hospitals and Medical Centers:
  - Mission Hospital
  - St. Francis Medical Center
- Community Centers/Resources:
  - Salvation Army
  - Huntington Park Community Center (6925 Salt Lake Ave. Huntington Park, CA 90255)

3.4 Infrastructure and Critical Services

Within Huntington Park, there is a variety of infrastructure and critical services that are vulnerable to climate change. Assets within this category include water services, wastewater, storm drainage and flood protection, solid and hazardous waste and recycling, fire services, emergency services, medical services, utilities and major utility corridors, public transportation, roadways, and active transportation routes. This asset group is sensitive to climate change as the impacts of hazards can affect the ability to provide services and resources; and, the infrastructure in place may not be adequately prepared to sustain increasing and compounding hazards. The following public services may be sensitive to the impacts of climate change. Services information was drawn from the Huntington Park General Plan.

- The city is served by four water companies that receive water from either local groundwater sources or from the Metropolitan Water District. The four water companies are:
  - Maywood Mutual Water Company
  - Walnut Park Mutual Water Company
  - Golden State Water Company
  - Seven Trent Services
- Critical Water Infrastructure includes:
  - H.P. Water Well/Reservoir #12
  - H.P. Water Well/Reservoir #14
  - H.P. Water Well/Reservoir/Elevated Tank #15
  - H.P. Water Well/Reservoir #16
  - H.P. Water Well/Reservoir/Elevated Tank #17
  - H.P. Water Well #18
  - H.P. Water Reservoir #18
  - Maywood Water Well
  - Southern California Water Reservoir
- The Huntington Park Public Works Department maintains the City's sewer system.

- The City's wastewater is conveyed to the Joint Water Pollution Control Plant, a regional treatment facility located outside of the jurisdictional boundaries at 24501 Figueroa Street in Carson. The wastewater plant is maintained and operated by the Los Angeles County Sanitation District.
- Most stormwater drains in Huntington Park are owned and maintained by the Los Angeles County Flood Control District. The city's storm drains parallel major arterials and connect to the Los Angeles River channel 1.9 miles to the east of the city. There are storm drains along the major arterials in the city.
- Southern California Gas Company provides natural gas services to the city.
- Southern California Edison (SCE) Company provided electricity to the city.
- Critical electricity infrastructure includes the Edison Power Transfer Station
- The Huntington Park Police Department provides police services to the city.
- Huntington Park contracts with Los Angeles County Fire Department, Battalion 13 for fire services.
- Trash collection is provided by United Pacific Waste and Waste Management Inc., as well as other private haulers.

4 Adaptive Capacity

Adaptive capacity is the ability to adjust to the consequences of climate change. This section summarizes the ways in which the City currently manages for the negative impacts of climate change. Types of adaptive capacity include adjustments in behavior, resources, and technologies. The City of Huntington Park has actively taken steps to increase the City's adaptive capacity. Existing policies, plans, programs, and institutions that increase the City's resilience to climate change impacts are organized by climate hazard and listed in Table 4.

Table 4 Program, Plans, and Policies to Manage Impacts of Climate Hazards

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
DRAFT 2030 City of Huntington Park General Plan	The City of Huntington Park General Plan includes actions that assess flooding, drought, and air quality issues within the City. The City proposes to work with the Los Angeles County Department of Public Works to identify and construct local and regional storm drain improvements, prepare a master drainage plan, and expand the capacity of the Rio Hondo and Los Angeles River channels. The plan also includes the requirement of drought-resistant landscaping. This plan was never adopted and so the policies and projects outline therein cannot be relied upon as a source of increased adaptive capacity for the City.	Stormwater Flooding, Drought, Air Quality
2004 City of Huntington Park Hazards Mitigation Plan	The Plan contains a series of proposed actions that align with the General Plan, Capital Improvement Plans, and City Building & Safety Codes. Some of these proposed action items include enhancing debris management and building safety measures for stormwater flooding. The plan also mentions the improvement of City water systems, enhancing utility and communications systems for emergency services, and conducting community outreach to educate about natural hazards.	Stormwater Flooding, Drought
2020 County of Los Angeles All-Hazards Mitigation Plan	The County of Los Angeles All-Hazards Mitigation Plan includes potential mitigation actions to achieve AHMP goals. Some of these actions include creating an Urban Forest Management Plan for LA County and urban forests in response to an increase in extreme heat events and poor air quality. The Plan also includes implementing the Green Street Master Plan to slow and watershed ecosystem restoration to slow, filter, and cleanse stormwater flood runoff.	Extreme Heat, Drought, Stormwater Flooding, Air Quality

Existing and Planned Programs, Plans, and Policies	Objectives	Climate Hazard Mitigated
Southern California Edison (SCE) Medical Baseline Program (SCE 2022)	SCE provides assistance to individuals with medical need for electricity to develop emergency back-up contingency plans in the event of a power outage.	Extreme Heat, Stormwater Flooding
Southern California Edison (SCE) Critical Care Backup Battery Program (SCE 2021)	SCE offers customers enrolled in the Medical Baseline Program a free portable backup battery to power a medical device in the event or a power outage as well as a solar panel kit, at no cost.	Extreme Heat, Stormwater Flooding
Southern California Edison (SCE) Automated System (SCE 2022)	SCE regularly communicates with customers in the County during power outages and notifies customers when power will be restored. SCE provides customer service contact numbers for non-English speakers.	Extreme Heat, Stormwater Flooding
2020 Urban Water Management Plan City of Huntington Park	This plan was created in compliance with the Urban Water Management Planning Act. The plan evaluates efficient water uses, reclamation, and conservation activities and analyzes the City's water system, water demands, and projects for future water supply capacity. The plan proposes water operation management tools to support groundwater production projects and includes a drought contingency plan, or, "Water Conservation and Drought Management Plan" codified in Title 6, Chapter 5 of the municipal code. The contingency plan imposes water use reductions in six standard phases, based on total water supply and use of AMI meter technology to assess water production and consumption.	Drought
Environmental Justice Element of the Huntington Park General Plan	This element adopted November 15, 2022 includes policies and programs to address pollution and air quality issues, public facilities and accessibility, food access, safe and sanitary homes, physical activity and community health, and civic engagement.	Air Quality, Extreme Heat

5 Vulnerability Analysis

The following section outlines the impacts each climate hazard has on community assets and services, as described in the Populations, Assets, and Services at Risk.

section. Existing plans, policies, and programs that contribute to the adaptive capacity are summarized throughout. An impact score and an adaptive capacity score is identified for each asset by climate hazard, along with an overall vulnerability score consistent with the scoring methodology described in Vulnerability Assessment Methodology.

5.1 Priority Populations

Individuals with high outdoor exposure

- People experiencing homelessness (0.4%)
- Outdoor workers (6%)

Outdoor workers and people experiencing homelessness face high exposure to outdoor conditions and are at much greater risk from various climate hazards. In Huntington Park, approximately 6% of residents work outdoors.

Huntington Park had an estimated 230 unsheltered individuals at a point-in-time count conducted by SCAG in 2019 (SCAG 2020). Unhoused individuals experience higher rates of respiratory conditions, mental illness and other chronic health conditions that increase sensitivity to climate hazards, and may limit access to resources to respond to climate hazards.

Community Feedback on Climate Impacts

In preparation of this analysis, feedback on experiences with climate hazards was solicited from the community at two well-attended farmers markets, one on August 31, 2022 and the second on September 7, 2022. Posters with questions regarding climate and resilience were available, and community members could write responses on sticky-notes and add them to the posters. Volunteers were available to facilitate and answer questions in English and Spanish.

When provided a list of climate hazards impacting Huntington Park and asked which hazards were of greatest concern, community members expressed the most concern for air quality hazards and heat waves.

When asked about which heat wave impacts members of the community have already experienced, commonly mentioned impacts included loss of electricity as well as physiological impacts including hospitalization, headaches, nausea, dizziness, fatigue, difficulty breathing, fainting and dehydration. Community members described not having air conditioning or adequate insulation in their housing, issues with mosquitoes when relying on open windows for cooling, and uncomfortably warm conditions at night.

Potential Impacts

Extreme Heat

Outdoor workers and people experiencing homelessness have an elevated risk of health impacts from extreme heat. Outdoor workers, including construction workers, roofers, and landscapers, are often subject to strenuous work conditions where there is limited access to cooling through shade or air conditioning, increasing their heat exposure and health risks during extreme heat events. People experiencing homelessness are exposed to health-related impacts associated with extreme heat because they have limited access to shelter and air conditioning. The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020).

Stormwater Flooding

Outdoor workers may be exposed to hazardous work conditions during stormwater flooding events and therefore face higher risk of experiencing health impacts (CDPH 2020). People experiencing homelessness are disproportionately at risk to health impacts during flood events because they often live in flood hazard areas and do not have access to transportation to evacuate inundated areas. They may also have their personal belongings destroyed or damaged during a flood event, compounding resource and adaptation constraints. (Ramin & Svoboda 2009).

Air Quality

Outdoor workers and people experiencing homelessness are disproportionally impacted by poor air quality because they are outdoors and are directly exposed to air pollutants for longer periods of time and during hotter parts of the day when levels of ground-level pollutants such as Ozone are higher (CDPH 2017). Both populations may experience exacerbation or development of respiratory diseases and conditions, such as asthma and chronic obstructive pulmonary disease (COPD), and respiratory infections, which in some cases may be life-threatening (Ramin & Svoboda 2009).

Drought

Outdoor workers and people experiencing homelessness are at risk to drought conditions and associated cascading impacts. During prolonged drought conditions, people experiencing homelessness may have difficulty accessing clean and affordable drinking water (Gamble & Balbuls 2016).

Under-resourced Individuals

- **Low-income (56%)**
- **Unemployed (7%)**
- **Individuals with no health insurance (18%)**
- **Households without a computer (11%)**
- **Households without a broadband internet (18%)**
- **Renters (73%)**
- **Isolated Individuals (13%)**
- **Single-female heads of households (10%)**
- **Individuals with educational attainment of less than 4 years of college (92%)**

Refer to Table 3 which enumerates the size of these priority populations in Huntington Park compared to state or regional statistics. Bolded groups are a higher percentage of the population

compared to state or regional percentages where comparable statistics are available.

Under-resourced individuals often do not have access or the ability to afford resources needed to prepare for, cope with, and recover from climate change impacts. When evacuation is necessary due to a climate hazard, under-resourced individuals may lack the financial resources to evacuate and/or find an affordable alternative place to stay when evacuated. Individuals who are unemployed or have low-income often face financial barriers when preparing for and recovering from climate change hazards. Individuals in these groups often live in homes that are less protected against climate hazards. Low-income individuals may not be able to take time off work to address health concerns either caused by or worsened by climate hazards.

Individuals with educational attainment of less than 4 years of college typically have lower earning potential than those with a 4-year college degree. As defined by the U.S. Census Bureau, this population group does not include individuals who have attended trade schools, apprentice program, or who have attained associates degrees. These individuals are more likely to work in outdoor and/or labor-intensive environments (CDPH 2017). Individuals with 4-year degrees are half as likely to be unemployed than those who only have a high school degree (APLGU N.d). Individuals in this group are therefore less likely to have access to transportation, healthcare, and other basic needs.

"Single female heads of households," defined by the U.S. Census as female householders with children under 18-years-old and no spouse/partner present, often face high levels of work-life conflict and financial hardship, which can make preparing for, coping with, and recovering from climate hazards more challenging. They are also more likely to serve as the primary caretaker of children which can make evacuating during a hazard scenario difficult (Flanagan et al. 2011). Additionally, women's wages tend to be lower than their male counterparts. According to U.S. Census Bureau data, in 2020, women earned 84% of what men earned (Pew Research Center 2021).

Households without a computer or broadband internet may not receive emergency alerts or governmental guidance before or during a climate hazard event, increasing risk during evacuation scenarios. Individuals without health insurance are more likely to have undiagnosed pre-existing health conditions which may make them more susceptible to health impacts from climate hazards (Gamble & Balbuls 2016). Individuals who rent housing have limited ability to weatherize their homes for hazard events. They also may not have temperature control in their housing units and generally experience a higher water and energy utilities cost burden than homeowners (Cooley et al. 2012). Isolated individuals lacking access to transportation may not be able to evacuate during climate hazards and may face greater barriers to accessing resources to prepare for, respond to, and recover from climate hazards.

Potential Impacts

Extreme Heat

Under-resourced individuals may not be able to pay for adequate air conditioning or fans, increasing their exposure to extreme heat. Isolated individuals don't have access to a vehicle to travel to cooling centers or move to temporary shelters during extreme heat event (Cooley et al. 2012). Under-resourced individuals are less likely to receive medical care for illnesses triggered or exacerbated by extreme heat. Households without a computer or broadband internet may not receive heat advisory warnings or governmental guidance, causing them to experience increased likelihood of health impacts from extreme heat exposure (CDPH 2017).

Drought

During periods of prolonged drought, under-resourced individuals are more likely to experience the cost burden associated with increased water rates (Feinstein et al. 2017). Additionally, these individuals may struggle to access clean and affordable drinking water which may cause dehydration and/or exacerbate underlying health conditions and illnesses (Gamble & Balbuls 2016).

Stormwater Flooding

Under-resourced individuals may experience injuries or death from high velocity flooding and are less likely to receive medical treatment (CDPH 2017). Individuals in these groups may experience cost burdens if their belongings and homes are damaged from floodwater inundation. Isolated individuals have limited or no access to a vehicle to evacuate flood hazard areas. Households without a computer or internet may not receive communications and emergency alerts to safely evacuate from hazard areas (CDPH 2020). Renters have limited control over home improvements that may protect against flood damage. Subsequently, they may experience economic and health impacts and a greater loss of belongings than homeowners (Gamble & Balbuls 2016).

Air Quality

Under-resourced individuals may be disproportionally impacted by poor air quality because they are more likely to live in housing without high quality insulation and lacking sufficient air filtration, and they may not be able to afford supplemental air filtration equipment (Gamble & Balbuls 2016). Individuals in these groups may experience the development or exacerbation of respiratory illnesses and are less likely to receive medical treatment (CDPH 2017).

Individuals Facing Societal Barriers

- **Non-white communities (99%)**
- **Linguistically isolated (43%)**
- Undocumented Individuals (N.A)
- **Incarcerated Individuals (N/A)**
- Students (N/A)

Refer to Table 3 which enumerates the size of these priority populations in Huntington Park compared to state or regional statistics. Bolded groups are a higher percentage of the population compared to state or regional percentages where comparable statistics are available. Given the number of schools in the city, the high proportion of children in the city, and estimates of undocumented immigrants in the region and subregion it is likely that both undocumented individuals and students make up a larger proportion of the population than comparable regional or state statistics, but these demographic comparisons are unable to be confirmed for Huntington Park at this time. The ranking for incarcerated individuals was produced regionally and not as a percentage of population. See the section on Additional Sensitive Populations for more information on why these priority populations are included in the analysis.

According to U.S. Census, 2020 American Community Survey, 45% of Huntington Park's population identifies as non-white, and 97% identify as Hispanic or Latino/a/x. Communities of color face societal disadvantages in preparing for, coping with, and recovering from climate hazards. Individuals facing societal barriers are directly impacted by social and economic challenges that are ubiquitous in our modern society. These challenges create educational, resource, economic, and health disparities that leave communities of color at much greater risk to climate change impacts (Baird 2008). Across

California, non-white individuals are more likely to live in high hazard risk areas and less likely to be homeowners, which leaves them more susceptible to climate hazards (CDPH 2020). Undocumented individuals often lack access to medical services, quality housing, and basic needs. Because these individuals are not citizens, they lack access to social and economic services that would allow them to prepare for, respond to, and cope with climate hazards. Individuals who are linguistically isolated have no or limited English-speaking ability. If evacuation and/or advisory notices, hazard preparedness material, or governmental guidance are not provided in the appropriate language, linguistically isolated individuals may not be able to prepare for, cope with, or recover from a climate hazard (Gamble & Balbuls 2016). Incarcerated individuals have limited ability to control and alter their environment and may face conditions that increase risk of climate impacts due to overcrowding, inadequate cooling, inadequate provision of medical services, or institutional decisions regarding evacuation (Cowan 2022). Students may experience educational disruption and setbacks including reduced rates of graduation and college attendance as result of climate hazards that cause school closures, loss of personal property, and/or psychological distress, particularly students with additional characteristics that increase sensitivity to climate hazards (GAO 2022). Additionally, students have limited ability to modify the physical conditions at schools that affect climate hazard exposure and risk such as air filtration and air conditioning.

Potential Impacts

Extreme Heat

Across California, non-white communities and undocumented immigrants live in housing with insufficient protection from extreme heat events and limited or no affordable air conditioning at a higher rate than white communities. Nationally, Latino/a/x populations are 21 percent more likely than white populations to live in the hottest parts of cities, which have high concentrations of heat-retaining surfaces and sparse to no tree cover. Across the U.S., over 40 percent of Latino/a/x households are energy insecure and cannot afford to pay for the energy required to cool their homes (Hispanic Access Foundation 2022). Linguistically isolated individuals may not to be able to read heat advisory warnings or governmental guidance, potentially causing them to experience greater exposure to extreme heat (Gamble & Balbuls 2016). Students without access to adequate cooling may experience decreased cognitive functioning and increased psychological distress which may impact their wellbeing and ability to be productive in the classroom (Laurent 2018). Extreme heat may strain the air conditioning systems at jails and potentially lead to a lack of insufficiently cooled spaces for incarcerated individuals, who have limited mobility and options to adapt to increased temperatures. The primary health impacts to these populations are heat-related illnesses, such as heat stress, heat stroke, and dehydration, which can be life-threatening (CDPH 2020). Undocumented immigrants may not have access to medical services to treat heat-related illnesses.

Drought

Non-white communities and undocumented immigrants are at higher risk to drought conditions and associated cascading impacts. Individuals in these groups may face systemic and/or cultural barriers when seeking to access affordable and clean drinking water, which may cause dehydration and/or exacerbate underlying health conditions and illnesses (Gamble & Balbuls 2016). Undocumented immigrants may not have access to medical services or drought relief programs and services (Mendez et al. 2020).

Stormwater Flooding

Across California, non-white communities and undocumented immigrants are more likely to live in flood hazard areas and in housing with insufficient protection against riverine and stormwater flooding (CDPH 2020). Linguistically isolated individuals may not be able to read flood warning or governmental guidance, potentially causing them to experience greater exposure to flooding. Individuals in these groups may face systematic and/or cultural barriers when seeking to access resources needed to safely evacuate hazard areas (Gamble & Balbuls 2016). Individuals in these groups may experience injuries or death from high velocity flooding (CDPH 2017). Undocumented immigrants may not have access to medical services to treat injuries (Mendez et al. 2020).

Air Quality

Non-white communities and undocumented immigrants are vulnerable to health impacts associated with poor air quality because their housing may lack sufficient air filtration and they may not be able to afford supplemental air filtration equipment (CDPH 2020). Undocumented immigrants are less likely to receive medical treatment for health impacts from poor air quality exposure (Mendez et al. 2020). Linguistically isolated individuals may not be able to read air quality advisory warnings or governmental guidance that are in English, potentially causing them to experience greater exposure to extreme heat (CDPH 2017). Incarcerated individuals and students have limited ability to modify exposures to poor air quality that are mediated by the jail or school, such as whether there is adequate air filtration, insulation, open windows, and outdoor access.

Individuals with Chronic Health Conditions or Health Related Sensitivities

- **Children (8%)**
- Individuals with Cardiovascular Disease (22%)
- Individuals with Asthma (10%)
- Older Adults (9%)

Refer to Table 3 which enumerates the size of these priority populations in Huntington Park. Bolded groups are a higher percentage of the population compared to state or regional percentages. No comparable statistics were available at the state level for individuals with cardiovascular disease or asthma.

Individuals with chronic health conditions or health related sensitivities are socially and physiologically susceptible to climate change impacts and hazards. Individuals with chronic health conditions or disabilities may have limited or reduced mobility, mental function, or communication abilities, making it difficult to evacuate during or prepare for a climate hazard event. They may also have medical needs for electricity which may be impacted during a public safety power shutoff or climate hazard event. Individuals in these groups are more likely to have pre-existing medical conditions or chronic illnesses that may exacerbate the risk of illnesses and medical problems from climate hazards. Similarly, individuals with asthma, individuals with cardiovascular disease, and individuals with COPD are more likely to experience health impacts from climate hazards because of their pre-existing conditions or diseases. Children are socially and physiologically vulnerable to climate hazards. They often have limited understandings of climate hazards and insufficient resources to independently prepare for and safely respond during a climate hazard event. Children, especially young children, are reliant on their parental figures to ensure their

health, safety, and wellbeing. Children also have not fully physiologically developed and are therefore more prone to health effects of climate change impacts (Kenney et al. 2014). Individuals experiencing pollution burden are most likely already experiencing the negative respiratory and cardiovascular health impacts associated with environmental stressors. These individuals are particularly at risk of exacerbated health impacts from climate change impacts (Gamble & Balbuls 2016).

Potential Impacts

Extreme Heat

Individuals with chronic health conditions or health related sensitivities are particularly at risk of heat related illnesses during extreme heat events. Individuals with disabilities, older adults, and children may have difficulty turning on air conditioning or traveling to cooling centers during extreme heat events. Extreme heat conditions can exacerbate asthma, cardiovascular disease, certain disabilities, and other respiratory and cardiovascular conditions, potentially causing heat-related illnesses such as heat stress, heat stroke and dehydrations, which can be-life threatening (CDPH 2020). Children are still physiologically developing which means that they are less able to regulate their body temperature during extreme heat events while older adults are at greater risk of mortality under extreme heat events (Kenney et al. 2014, CDPH 2020).

Drought

Individuals with chronic health conditions or health related sensitivities are at risk to drought conditions and associated cascading impacts including lower water quality and risk of waterborne illness. Prolonged drought conditions can lead to water scarcity in the watershed serving communities and may contribute to worsening quality of water supplies. Even under severe drought conditions with mandatory water restrictions, water use restrictions still allow for enough water usage to serve basic needs. However, should individuals experience inadequate access to water as a result of a combination of circumstances including water restrictions, rate increases, overcrowding of housing, and other factors, dehydration can pose a health risk. Individuals with chronic health conditions or health related sensitives may experience negative health impacts if they become dehydrated. Children and older adults are especially at risk of dehydration as their bodies are not able to regulate as well (Kenney et al. 2014). Dehydration may exacerbate underlying health conditions and illnesses.

Stormwater Flooding

Older people and children are particularly at risk to injury and/or death from high velocity flooding (CDPH 2017). Stormwater flooding may limit access to transportation systems, healthcare centers, and emergency response to those in need of consistent medical care, such as those with chronic health conditions or illnesses. Children, older adults, individuals with disabilities, and individuals with chronic health conditions or illnesses may not be able to safely evacuate floodwater hazard areas.

Air Quality

Individuals with chronic health conditions or health related sensitivities are at risk of developing or experiencing exacerbated health impacts from poor air quality. Children are especially predisposed to health impacts from poor air quality because their respiratory system has not fully developed yet (CDPH 2020). Older adults and pollution burdened individuals are vulnerable to health impacts from poor air quality because they are more likely to have underlying respiratory and/or cardiovascular conditions. Individuals with cardiovascular disease, individuals with asthma, and individuals with COPD may experience severe health impacts if exposed to poor air quality (USEPA 2022).

Adaptive Capacity

The City of Huntington Park has some plans and programs in place that protect priority populations across climate hazards. The level of enforceability, implementation, maintenance, and efficacy varies based on the hazard type. Additionally, Los Angeles County has some plans, programs, and resources that enhance regional resilience or otherwise enhance Huntington Park's ability to respond to and adapt to climate change and climate hazards.

Projections from the California Heat Assessment Tool forecast that Huntington Park will see an increase of heat-related health events from 2.5 to 4.5 per census tract by mid-century, and 7 per census tract by end-century. The City of Huntington Park does not have planning documents directly addressing extreme heat. Los Angeles County Department of Public Health has a website providing educational content around extreme heat and an interactive map showing the locations of cooling centers, including the public library in Huntington Park, where residents may go if they lack access to air conditioning.

Community Feedback on Climate Resilience

Community feedback solicited during two farmers market events in the summer of 2022 highlighted numerous barriers for community members in preparing for climate hazards. Community members also provided recommendations for improving resilience. A summary is included below:

- Parks and playgrounds need to be cleaned up, improved, and made to feel safe from gang activity.
- Additional splash parks, benches with shade, and trees at parks for more cooling opportunities need to be provided.
- Houses lack air-conditioning and adequate insulation, fans and more cooling centers should be provided to residents.
- There is a need for education on how to prepare for and protect oneself and family members from extreme heat and other hazards while reducing energy consumption.
- Public transit needs improvements, including more transit stops, more bus shelters and better accessibility.
- Narrow streets are difficult for emergency vehicles to navigate.
- More trees and shade structures are needed throughout the city for shade and air quality improvements.
- Rebates or programs to help people purchase air conditioning, or more efficient appliances.

City and County plans concerning stormwater flooding, watershed management, and drought mainly address infrastructure capacity and resilience, water source reliability and future demand, and drainage improvements. If the identified strategies and projects for improving drainage and increasing flood channel capacity are implemented and maintained they will serve to reduce the likelihood of disruptions in service due to infrastructure failure and reduce the likelihood of stormwater flooding due to overwhelm of the drainage infrastructure, thereby reducing risk for sensitive populations. The urban water management plan and the Water Conservation and Drought Management Plan can serve as a platform of water access assurance for sensitive populations.

Southern California Edison offers two programs, the Medical Baseline Program and the Critical Care Backup Battery Program that can protect sensitive populations with medical needs for electricity during power outages caused by climate hazards.

The Draft 2030 General Plan includes policies aimed at making improvements across a wide range of amenities and services in the city. Policies include proposals and plans for reducing vehicular air pollution, improving public transportation access, conserving water, requiring bus shelters at some new developments, improving park and recreational facilities, drainage improvements, and expansion of housing stock. If implemented these policies can help to mitigate some of the risk from climate hazards for priority populations and support a more resilient community; however, the plan was never adopted and so the policies and programs outlined in the draft plan cannot be considered a source of adaptive capacity.

In order to be eligible for Federal Emergency Management Agency (FEMA) grants from the Pre-Disaster Mitigation Program or the Post-Disaster Hazard Mitigation Program, local communities must prepare a local hazard mitigation plan (LHMP) and update the plan at least every five years. The City's current LHMP has not been updated within the last five years. This reduces Huntington Park's ability to receive funds to help prevent and recover from climate hazards, as well as reduce damage and costs of disasters and increase climate resilience. This can be improved by updating the Huntington Park Natural Hazard Mitigation Plan.

Vulnerability Score for Priority Populations

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Low	**5-High**
Drought	High	Medium	**4-High**
Stormwater Flooding	Medium	Low	**4-High**
Air Quality	High	Low	**5-High**

5.2 Natural & Recreational Resources

Potential Impacts

Primary sensitivities for natural resources are associated with climate hazard-caused stress and physical damage to resource types within this asset group. Compounding climate hazards will stress natural ecosystems past their ability to absorb individual climate hazards. Wildlife will seek out more conducive habitats during climate hazards such as extreme heat or drought which tend to be where people recreate (Hand et al. 2018). Recreational areas are also placed under increased risk via climate projections creating additional stress and competing needs for safe habitats.

Extreme Heat

Increased temperatures can cause vegetation stress in parks, landscaping, and the urban forest. Indirect impacts could include reduced carbon storage and increased tree and vegetation mortality, as well as increased watering and related costs. Increased temperatures could also impact summer recreation and community programing resulting in economic loss for the City (PG&E n.d.).

Drought

Drought would likely increase irrigation requirements for maintaining landscaping, park facilities, and street trees, while water use restrictions would potentially prevent asset managers from meeting this increased watering demand, resulting in water-stressed vegetation, increased vegetation mortality, and potentially reducing the quality of and benefits provided by recreational resources such as open spaces and parks and the urban forest.

Stormwater Flooding

California's Fourth Climate Change Assessment projects more extreme precipitation events will occur throughout the Los Angeles region, which may lead to low-lying areas throughout Huntington Park to experience more frequent flooding. In addition, heavy precipitation events could flood recreation facilities, impacting service. Additionally, stormwater flooding can reduce overall water quality through transport of pollutants including potentially hazardous materials via runoff into the water drainage system and wherever floodwaters accumulate as well as algae blooms from increased nutrients (USEPA 2022).

Air Quality

The direct effects of air quality declines on natural resources and parks relates to plant and wildlife health as increased levels of air pollutants cause stress and mortality. Impacts from air quality can further impact natural resources since air quality declines correspond with other hazards, such as extreme heat, compounding risks. The degradation of plant and wildlife health could impact the quality of recreational resources such as open spaces and parks. Impacts from air quality can also make outdoor recreational resources dangerous or unhealthy for sensitive groups identified in the Priority Populations section of this analysis.

Adaptive Capacity

There are no relevant plans programs or policies directly increasing the adaptive capacity of Huntington Park's natural and recreational resources to the climate hazard of extreme heat.

Indirect planning exists around adaptation for natural recreational resources around flooding and drought including the Urban Water Management Plan, and policies encouraging or requiring drought

resistant landscaping. Huntington Park has implemented an Urban and Stormwater Management Program, including installation of a catch basin to collect and remove rash from stormwater runoff, street sweeping to reduce the amount of trash and polluted dust that would get picked up in runoff, and industrial and commercial facility inspections.

Vulnerability Score for Natural & Recreational Resources

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Low	**5-High**
Drought	High	Medium	**4-High**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Medium	Low	**4-High**

5.3 Buildings and Facilities

Potential Impacts

Extreme Heat and Warm Nights

Increased temperatures are likely to result in minimal impact to physical structures. Indirect impacts could include strain on HVAC systems and increased in cooling costs. Extreme heat could impact occupants of buildings and facilities that are not adequately weatherized for increased temperatures.

Drought

Drought will have minimal impact on the physical structures of buildings and facilities across Huntington Park.

Stormwater Flooding

The extent of impacts from stormwater flooding in urban areas is difficult to assess given currently available tools, and because FEMA flood maps and analyses were not developed to assess urban flood hazards (NASEM 2019). Flooding may cause damage to buildings and facilities or render them temporarily unusable should flooding of buildings or facilities occur.

Air Quality

The impact of reduced air quality will have a similar effect as extreme heat for buildings and facilities. The ability to filter air will greatly affect the reliant subsystems, services, and populations reliant on buildings and facilities. The direct impact on structures is low.

Adaptive Capacity

Huntington Park is working with the Los Angeles County Department of Public Works to improve local and regional storm drainage infrastructure. The City has minimal existing adaptive capacity to increase the weatherization of buildings and facilities throughout the city.

Vulnerability Score for Buildings and Facilities

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	Medium	Low	**4-High**
Drought	Low	Medium	**2-Medium**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Low	Low	**2-Medium**

5.4 Infrastructure and Critical Services

Potential Impacts

Extreme Heat and Warm Nights

As temperatures increase, roadways, active transportation routes, and railroads are vulnerable to damages through sustained heat such as buckled railroad ties and cracked surfaces (Kalansky et al. 2018). Additional impacts from extreme heat are associated with increased emergency service calls which could strain medical services. Electrical infrastructure could be overwhelmed by demand and result in blackouts or energy providers could conduct power safety shutoffs to avoid impacts to electrical facilities. Power outages have significant impacts on communication networks, water conveyance, and vulnerable populations. The ability for emergency services to fully function is a cascading impact of power outages which can place additional strain on services during extreme heat events.

Drought

Drought can impact water reliability and water infrastructure. All emergency services depend on water, particularly firefighters who require adequate water supply for fire suppression. Water providers within the county will encounter increased difficulty as drought impacts general service reliability. Drought impacts can create service strain for emergency and medical services.

Stormwater Flooding

Impervious surfaces can impede the absorption of water and augment stormwater flooding in areas of Huntington Park. The City's storm drains parallel major arterials and connect to the Los Angeles River outside of the city. There is risk of damage from increased extreme precipitation events including localized flooding, erosion, transport of debris, and sediment deposition. Storm drainage and flood protection services for the City may be impacted by these events, and flooded roadways may be temporarily impassable, disrupt or delay provision of emergency services, or increase risk to road users.

Air Quality

Higher incidence of unsafe air quality generated by increased smog, dust and pollutants can create general strain on existing infrastructure and critical services through increased rates of hospitalization and emergency and medical services (CDPH 2020).

Adaptive Capacity

Vulnerability Score for Services and Infrastructure

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Extreme Heat	High	Low	**5-High**
Drought	High	Low	**5-High**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Medium	Low	**4-High**

6 Conclusion

This report evaluates how climate change may impact community members, natural resources, critical facilities, buildings, services, and infrastructure in Huntington Park. The report provides a list of priority populations and community assets for which adaptation policies and programs should be developed and implemented to increase community resilience. Vulnerability scoring is based on the combination of potential impacts and adaptive capacity, as identified in the Vulnerability Assessment Methodology section of the report.

A list of asset categories with high vulnerability scores is provided on the next page.

- All sensitive population groups identified are at high risk due to poor air quality, extreme heat, and drought and at medium risk for impacts from storm flooding.
- Natural resources are highly vulnerable to extreme heat, drought, air quality, and storm flooding. Vulnerability for natural resources is focused on damage or strain on recreational resources as well as mortality and scarcity of resources for plants and wildlife.
- Buildings and facilities in the city are vulnerable to extreme heat and potential damage from storm flooding.
- Infrastructure and critical facilities are highly vulnerable to extreme heat, air quality, and drought, with some vulnerability to stormwater flooding. Infrastructure and dependent populations experience additional cascading impacts around power outages from downed utility lines, power safety shut offs and grid overload. All forms of power outages can affect how critical services are able to perform their needed functions during a hazard.

Climate Hazard	Impact Score	Adaptive Capacity Score	Vulnerability Score
Priority Populations			
Extreme Heat	High	Low	**5-High**
Drought	High	Medium	**4-High**
Stormwater Flooding	Medium	Low	**4-High**
Air Quality	High	Low	**5-High**
Natural & Recreational Resources			
Extreme Heat	High	Low	**5-High**
Drought	High	Medium	**4-High**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Medium	Low	**4-High**
Buildings & Facilities			
Extreme Heat	Medium	Low	**4-High**
Drought	Low	Medium	**2-Medium**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Low	Low	**2-Medium**
Infrastructure & Critical Services			
Extreme Heat	High	Low	**5-High**
Drought	High	Low	**5-High**
Stormwater Flooding	Medium	Medium	**3-Medium**
Air Quality	Medium	Low	**4-High**

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CITY OF HUNTINGTON PARK GENERAL PLAN

HEALTH AND SAFETY ELEMENT

Appendix S-2
Evacuation Analysis

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July 11, 2023

Mr. Michael Rocque, MS, Senior Planner
Rincon Consultants, Inc.
2215 Faraday Ave Suite A,
Carlsbad, CA 92008
(via email)

Subject: Evacuation Analysis for the City of Huntington Park Housing Element Code Amendments

Dear Michael:

Translutions, Inc. (Translutions) is pleased to provide this letter discussing the evacuation routes in the City of Huntington Park under the requirements of Assembly Bill (AB) 747. AB 747 (2019) requires that the City's safety element be reviewed and updated to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. This is a requirement for all safety elements or updates to hazard mitigation plans completed after January of 2022.

BACKGROUND

AB 747 added Section 65302.15 to the California Government Code (amended by AB 1409), which became effective in January 2022 and requires local governments to review and update as needed their Safety Element during an update to their Housing Element or Local Hazard Mitigation Plan (LHMP), or no less than every eight years. Specifically, AB 747 requires local governments to identify the capacity, safety, and viability of evacuation routes and locations in the Safety Element or LHMP on or before the next update of their LHMP. Under AB 747, a variety of emergency scenarios must be evaluated to determine the evacuation network's capabilities. Under this, the amount of time available for an evacuation, which is directly related to the amount of lead time available for planning the evacuation, must be considered while examining the system's capacity. It should be noted that roadway capacity normally does not become a problem during an evacuation with enough warning, except for a few minor congested areas. However, when there is very little time to prepare for an evacuation, as was the case during the Camp Fire in Paradise, California, the capacity of the evacuation system became a problem.

Based on discussion with the City, the following two evacuation scenarios were evaluated as part of Huntington Park's Safety Element Update.

HAZMAT Spill. Due to the proximity of the City to the City of Vernon, which has a lot of industrial uses, there are potential threats due to explosions and HAZMAT leaks. The chemical leaked/spilled determines the evacuation zone. Based on discussion with the Los Angeles County Fire Department, emergency responders use a model that uses wind direction, wind speed, chemical name etc. and get the locations and extent of evacuation and are determined on a case-by-case basis. This analysis was based on an evacuation area provided by the City and shown in Figure 1. The triangle shows the potential evacuation area for a major HAZMAT spill in the Alameda corridor with the wind coming from the East, which is the scenario where the most impacts would occur in the City of Huntington Park. All residents within the triangle would be evacuated with the help of the Police Department. Traffic would be pushed North and South within the affected area and would go East from Seville on.

Fire Evacuation. The main evacuation determinant for Fire is which way the wind is blowing, which direction, where to evac first, and how widespread the fire is. Based on discussion with the Police and Fire Departments, the main area of concern for fire evacuation is Concord Apartments. Figure 2 shows the location of the apartment building. The green square would be an immediate and temporary evacuation zone during the actual fire fight until the building could be safely cleared by the city inspector. There are approximately 162 units in the building and depending on which floors the fire affected, will determine the number of displaced individuals. Temporary shelters would need to be established for a potential large number of people. This analysis is based on evacuation of the entire building.

EVACUATION ANALYSIS FOR HAZMAT SPILL SCENARIO

Methodology. The evacuation analysis for this scenario was conducted using 2016 Southern California Association of Governments (SCAG) Regional Transportation Plan and Sustainable Communities (RTP/SCS) regional travel demand model. The Year 2020 scenario of the travel model was used in the analysis to present a worst-case analysis because the 2040 SCAG model shows a reduction in traffic. SCAG RTP/SCS model uses two tiers for traffic analysis zones (TAZs) – Tier 1 and Tier 2. Tier 2 zones are used for model trip generation, distribution, and mode choice steps whereas Tier1 zones are used for traffic assignment.

The first step of the analysis would require identification of evacuation area (origin area) and location of evacuation shelters (destinations) for the evacuees. The evacuation shelters should be outside of the impacted area. As indicated before the evacuation area is shown in Figure 1. The area in the figure (triangle) was approximated to two Tier 1 TAZs of the model. Based on the information provided by County Fire regarding the direction of travel for evacuees, two TAZs outside the City boundary were identified. Figure 3 identifies the TAZs that were used to approximate the evacuation area and area of shelters for evacuees.

Evacuation Time Period. The amount of time required for evacuation depends on the surrounding roadway conditions/traffic congestion. Given SCAG RTP/SCS represents a typical weekday and the roadway congestion is typically worse during the AM and PM peak periods on a weekday, the evacuation was assumed to occur during AM peak period. AM peak period in the SCAG model represents 6:00 – 9:00 AM. Evacuation notification was assumed to occur at 7:00 AM and the evacuation was assumed to start at 7:30 AM.

The departure distribution of evacuation trips was built based on research conducted for other evacuation studies that are based on the resident and employee surveys for those regions. The same evacuation curves/distribution was used for both resident/household and employment trips. Table A shows the percentage of trips beginning evacuation trip after the evacuation notice.

Table A: Percentage of Trips Beginning Evacuation Trip after Evacuation Notice.

Time Interval (AM)	Percent Trips Evacuating
7:00-7:14	0
7:15-7:29	0
7:30-7:44	8%
7:45-7:59	25%
8:00-8:14	30%
8:15-8:29	25%
8:30-8:44	10%
8:45-8:59	2%
9:00-9:14	0

Estimation of Evacuation Trips. The number of evacuation vehicle trips were developed using socioeconomic data (households and employment) from the 2020 SCAG RTP/SCS model. Number of households and employment for the evacuation area from the SCAG RTP/SCS model is shown in Table B.

Table B: Total Households and Employment within Evacuation Area

Total Households in Evacuation Area	2,256
Total Employees	3,401
Percent Employees Assumed for Evacuation	10%

Source : 2016 SCAG RTP/SCS Tier1 2020 Socio Economic data

Only residents and employees were assumed for evacuation. No evacuation trips from schools were included in the trip generation as the evacuation was assumed to start by 7:30 AM and school age children would still be at their residences. Similarly, only 10% of employment was assumed to be present in the evacuation area as the evacuation was assumed to start before the start of typical workday (8:00 AM). The number of vehicle trips by residents/households depend on the number of persons in the household, auto ownership and auto availability. The evacuation vehicle trip rate per household was borrowed from other evacuation studies. A trip rate of 1.91 vehicles per household was used to estimate evacuation trips in the area. For employment, an average auto occupancy of 1 was used to estimate employee vehicle trips. While auto occupancy for work trips has been higher than 1, auto occupancy of 1 was used to present a conservative scenario. Table C shows the total vehicle trips in the evacuation area. Also, given the nature of the model, evacuation trips by other modes were not considered in the analysis.

Table C: Total Evacuation Vehicle Trips

Total Household Vehicle Trips to be Evacuated	4,309
Total Employee Vehicle Trips to be Evacuated	340
Total Evacuation Vehicle Trips	4,649

Notes:
Household evacuation vehicle trip rate of 1.91 was obtained from other studies
Average auto occupancy of 1.0 was assumed for employee trips

Roadway Network Conditions. The typical daily operating conditions for both the number of travel lanes per direction and associated hourly capacity per lane from the SCAG roadway network were used as the baseline road capacities. No lane closures or adjustments to roadway capacities were assumed due to the type of evacuation event (HAZMAT Spill). Depending on the type of evacuation event,

modification of network capacities may be necessary, for example in the event of a fire, roadway capacities in the area may be reduced by visibility issues due to smoke and flying debris. Similarly, no roadway closures or no major traffic incidents were assumed in the evaluation of this scenario that would impede egress from the area.

Evacuation Assessment. Evacuation time estimate (ETE) is the total time taken from beginning of the evacuation to when evacuees reach their destination. Therefore, the ETE includes both evacuation trip generation time (evacuation start time in Table A) and evacuation travel time. To estimate the travel time to evacuation shelters/destinations, TransCAD's macroscopic dynamic traffic assignment (DTA) module was used. DTA requires the travel demand and transportation network to represent the evacuation condition.

Background Traffic: Evacuation specific vehicle trip generation for the area was described above. However, trips and congestion on the surrounding roadways should be accounted to appropriately estimate evacuation time estimates (ETE). 2020 AM peak period origin destination (OD) output from SCAG RTP/SCS was used to generate background traffic conditions. OD trips from the model for the evacuation were replaced by the vehicle trips shown above in Table C. As indicated above, AM period in the SCAG RTP/SCS model represents 6:00 – 9:00 AM.

SCAG RTP/SCS travel model uses a static assignment model that assumes steady-state traffic conditions over the entire AM peak period. The link flows, link costs and other quantities can be viewed as averages over the analysis period. It was determined that by ignoring the temporal distribution of traffic, a static assignment model tends to underestimate travel times. Therefore, DTA was used to appropriately estimate the evacuation travel times.

DTA is conducted for much shorter intervals such as 5, 10, 15, or 20 minutes. As such, after determining the evacuation travel demand and associated transportation network, a dynamic traffic assignment with 15-minute intervals was performed to reflect congestion and departure time to estimate travel time. The AM peak period OD trip table was disaggregated into 15-minute intervals using uniform distribution (8.3% background trips loading onto the network) to account for background traffic. Evacuation trips were distributed using normal distribution shown in previously referenced Table A.

TransCAD's DTA was run for all disaggregated time periods to estimate evacuation travel times. Average evacuation times are also provided based on the start time of the evacuation trip by 15-minute interval, for the scenario. The average evacuation times are shown in Table D.

Table D: Average Evacuation Travel Time (minutes) by Time Period

Evacuation Time Period	Average Travel Time (mins)
7:30-7:44	39.4
7:45-7:59	45.6
8:00-8:14	55.7
8:15-8:29	53.3
8:30-8:44	57.4
8:45-8:59	50.4

Based on DTA as suggested above, it was estimated that approximately 140 minutes would be required to evacuate 100% of vehicle trips from the evacuation area to the designated destinations. The evacuation time estimate of 140 includes both evacuation trip generation (7:30 – 8:59) and the evacuation travel time. Therefore, if the evacuation starts at 7:30 AM in the morning, 100% of vehicle trips will be evacuated to destinations by 9:50 AM. Figure 4 illustrates the AM peak roadway VOC during the evacuation time periods.

EVACUATION ANALYSIS FOR FIRE SCENARIO

Methodology. The evacuation analysis for this scenario was conducted using the 2016 SCAG RTP/SCS Model. Only the assisted living facility was assumed for evacuation. The facility includes a total of 162 units. Both residents and caretakers of the facility were included in the evacuation. The Institute of Transportation Engineers (ITE) *Trip Generation* 11th Edition includes trip rates for land uses by different units. Trip rates for the number of beds/units and employees were used to estimate the number of employees for 162 units. Using the trip rates, it was estimated that 162 would include approximately 100 daily employees. To present a worst-case scenario, it was assumed that the fire event occurred during shift change and all 100 employees were included in the evacuation scenario. Therefore, a total population of 262 people would be evacuated from the facility. Similar to the HAZMAT spill above, all the residents and employees are assumed to be evacuated to a location just outside the City boundary. Figure 5 identifies the TAZs that were used to approximate the evacuation area and area of shelter for evacuees.

Evacuation Time Period. Similar to HAZMAT spill, it was assumed that the evacuation notification would occur at 7:00 AM and the evacuation would start at 7:30 AM. A normal distribution (bell curve) was used for evacuation of the assisted living facility. Since residents are elderly, the bell curve is slightly different from the HAZMAT scenario. Table E shows the percentage of trips beginning the evacuation trip after evacuation notice.

Table E: Percentage of Trips Beginning Evacuation Trip after Evacuation Notice.

Time Interval (AM)	Percent Trips Evacuating
7:00-7:14	0%
7:15-7:29	0%
7:30-7:44	8%
7:45-7:59	20%
8:00-8:14	30%
8:15-8:29	20%
8:30-8:44	15%
8:45-8:59	7%
9:00-9:14	0%

Estimation of Evacuation Trips. Given this is an assisted facility, all the residents should be accompanied by employees. Both residents and employees are assumed to travel together to the evacuation location in vehicles arranged by the assisted living facility such as buses or vans due to absence of personal vehicles for the residents. To present a conservative scenario with respect to number of vehicle trips, 8 person vans were assumed to evacuate the facility and not buses. Table F shows the vehicle trip generation for the facility.

Table F: Assisted Living Facility Total Evacuation Vehicle Trips

Total Residents	162
Total Employees	100
Total Population to be Evacuated	262
Van Capacity	8
Total Number of Vehicle Trips Evacuation	33

Evacuation Assessment. Roadway conditions and background traffic assumptions described above from the HAZMAT spill were used to evaluate this scenario as well. Like HAZMAT spill scenario, TransCAD's DTA was run for all disaggregated time periods to estimate evacuation travel times. Average evacuation times are also provided based on the start time of the evacuation trip by 15-minute interval, for the scenario. The average evacuation times shown in Table G.

Table G: Average Evacuation Travel Time (minutes) by Time Period

Evacuation Time Period	Average Travel Time (mins)
7:30-7:44	17.4
7:45-7:59	18.3
8:00-8:14	19.9
8:15-8:29	19.7
8:30-8:44	19.1
8:45-8:59	17.8

Based on DTA as suggested above, it was estimated that approximately 109 minutes would be required to evacuate 100% of vehicle trips from the facility to the designated destination. The evacuation time estimate of 109 minutes includes both evacuation trip generation (7:30 – 8:59) and the evacuation travel time. Therefore, if the evacuation starts at 7:30 AM in the morning, 100% of vehicle trips will be evacuated to destinations by 9:19 AM. It should be noted that the evacuation trip generation time is the primary contributor for the ETE. Given the evacuation is for a single facility, the evacuation trip generation times can be condensed by streamlining evacuation which would decrease the total evacuation time estimates.

FINDINGS & CONCLUSION

The findings of the analysis show the following:

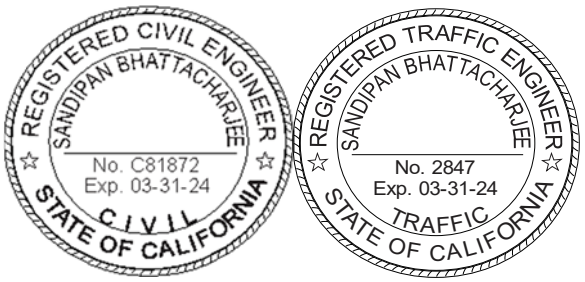
1. Approximately 109 minutes would be required to evacuate 100% of vehicle trips from Concord Apartments to the designated destinations.
2. Approximately 140 minutes would be required to evacuate 100% of vehicle trips in the area affected by HAZMAT spill to designated destinations.

We hope you will find this information helpful. Should you have any questions, please don't hesitate to call me at (949) 656-3131.

Sincerely,

translutions, Inc.

Sandipan Bhattacharjee, P.E., T.E., AICP, ENV SP
Principal



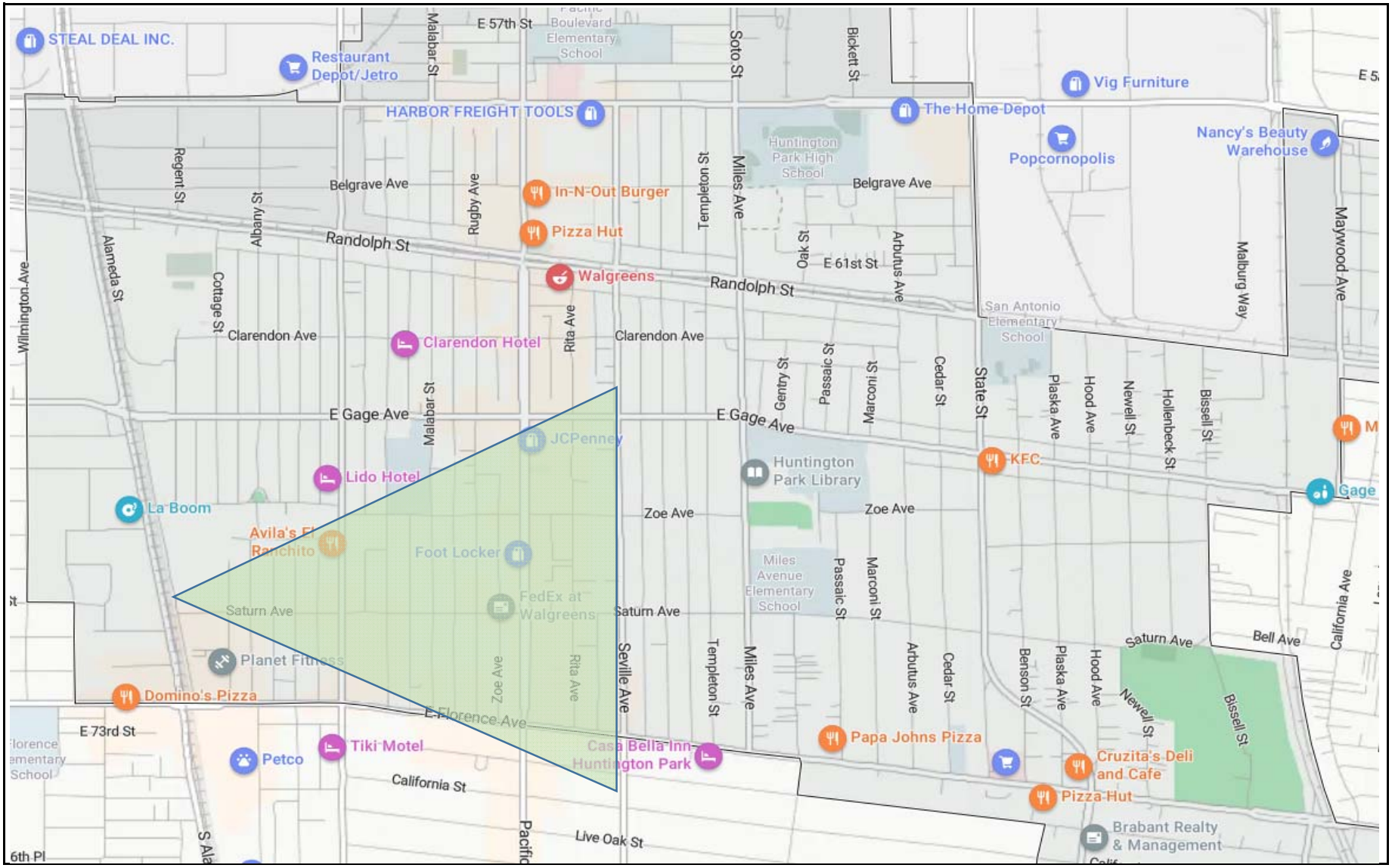


FIGURE 1

Evacuation Cone

City of Huntington Park Housing Element Code Amendments
Evacuation Area for HAZMAT Spill in Almeda Corridor

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P:\Rincon - Huntington Park Housing Element\Evacuation\Figure 1 HAZMAT Landscape (5/17/2023)

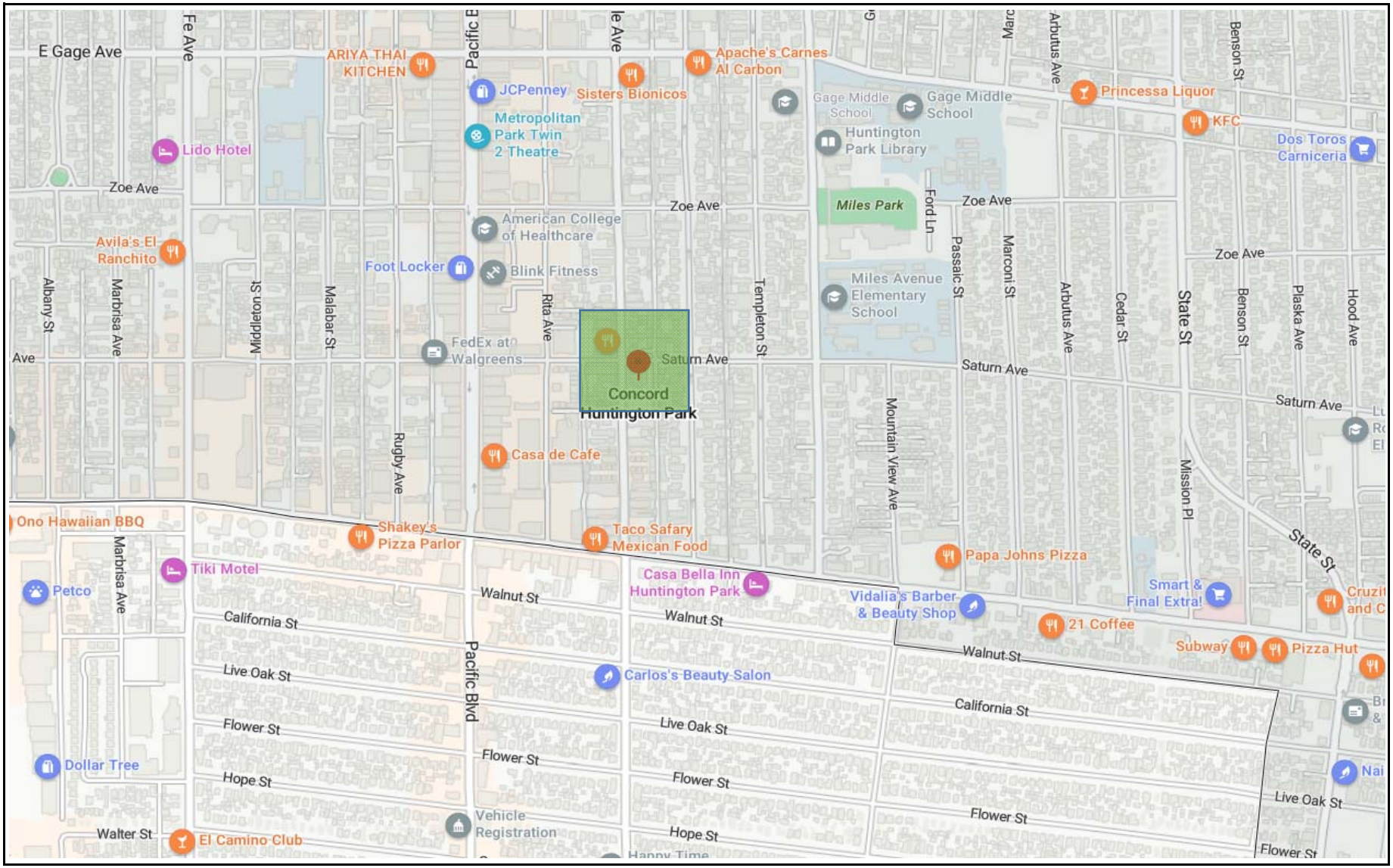

FIGURE 2

Evacuation Zone

City of Huntington Park Housing Element Code Amendments
Concord Assisted Living Facility Fire Evacuation

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P:\Rincon - Huntington Park Housing Element\Evacuation\Figure 2 Concord Landscape (5/17/2023)

FIGURE 3

Evacuation Zone

City of Huntington Park Housing Element Code Amendments
Evacuation Area and Evacuation Shelter Area TAZs

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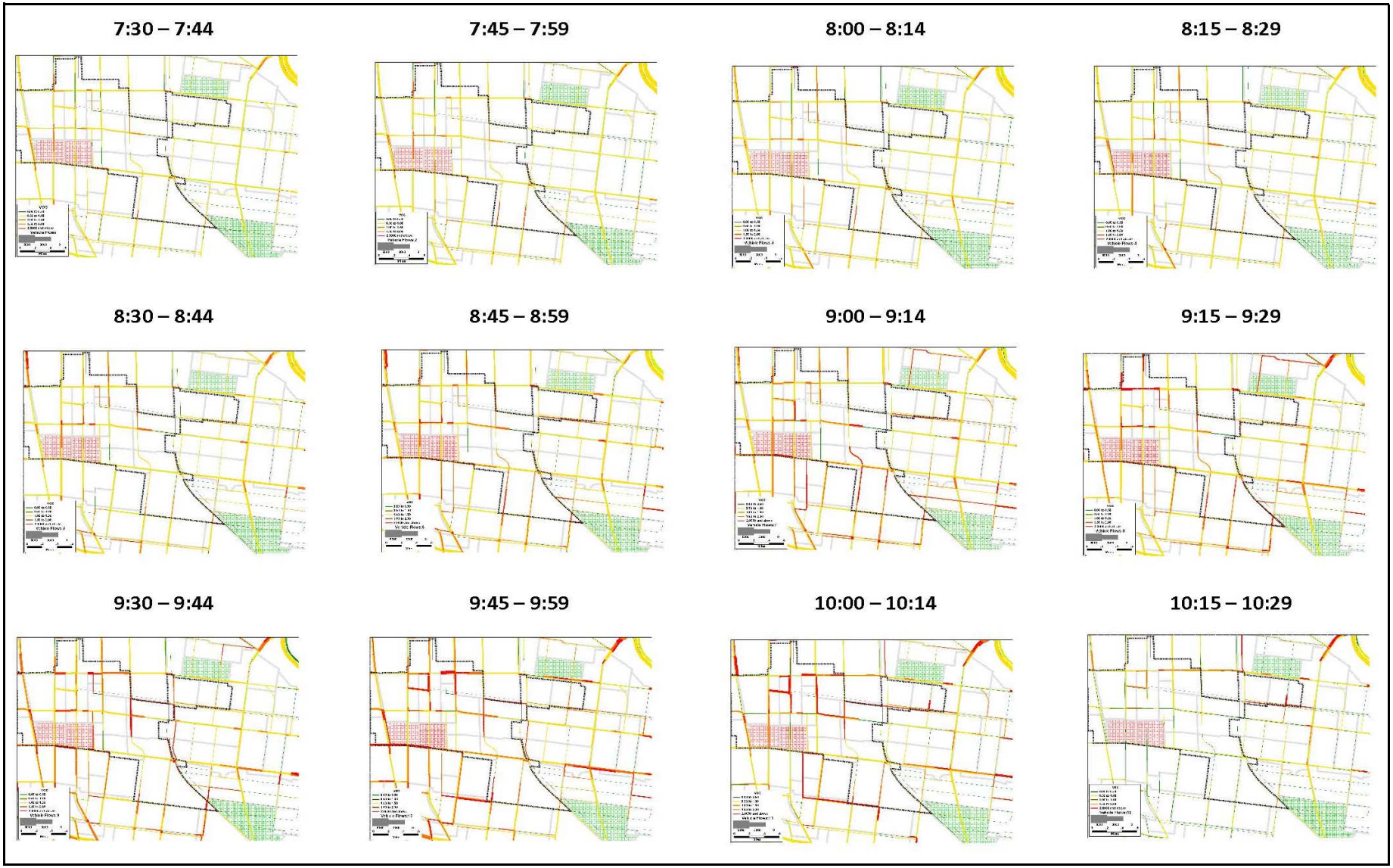

FIGURE 4

City of Huntington Park Housing Element Code Amendments
Roadway Volume/Capacity Ratio (VOC)

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FIGURE 5

City of Huntington Park Housing Element Code Amendments
Concord Assisted Living Evacuation Area and Evacuation Shelter Area TAZs

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