Beverly Hills Climate Action and Adaptation Plan

Climate Change Vulnerability Assessment

prepared by

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March 2023
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Introduction

Purpose

This report, the City of Beverly Hills Climate Change Vulnerability Assessment, evaluates how climate change may impact vulnerable community members and critical facilities and services in Beverly Hills. Beverly Hills is expected to experience increasing temperatures and extreme heat events, variable precipitation events including increased storm frequency and precipitation intensity and extended drought conditions, and more frequent and damaging wildfires. These climate change related hazards will adversely impact community members and critical facilities and services. The City has policies and programs already in place to prepare for some of these climate related hazards; however, as climate change impacts continue to advance more can be done to increase the community’s resilience to climate change.

This climate change vulnerability assessment examines the susceptibility of the City’s population, transportation, and critical infrastructure to harm from climate related hazards, and the community’s ability to adapt to the changing risks pertaining to climate hazards.

How Does Climate Change Work?

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 or 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. Greenhouse gases from human activities have been collecting in the atmosphere since the 1800’s and are warming the climate more and more every year. This rise in average temperatures across the globe affects ocean water levels, temperature, and chemistry; precipitation patterns and water supply; severity and frequency of wildfires; and prevalence of extreme heat events.

What is Vulnerability?

The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report defines vulnerability as “the propensity or predisposition to be adversely affected.” It adds that vulnerability “encompasses various concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.”

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improving public health and quality of life, and increasing resilience to climate change. Understanding the vulnerabilities that the community may face due to climate change provides a foundation to define adaptation actions for the Climate Action and Adaptation Plan and other planning efforts in Beverly Hills and the region.

The City of Beverly Hill is also in the process of complying with Senate Bill (SB) 379 which requires all cities and counties in California to update the Safety Element chapter of the General Plan to include climate adaptation and resilience strategies and an implementation plan informed by a climate change vulnerability assessment. Consistent with SB 379, the City prepared a Climate Vulnerability Assessment (February 2022) which is scheduled to be adopted by the Beverly Hills City Council in summer 2022. This report aligns with the findings of the Climate Vulnerability Assessment prepared in support of the City’s Safety Element Update.

**Approach**

The City of Beverly Hills Climate Change Vulnerability Assessment follows the vulnerability assessment process recommended by the California Governor’s Office of Emergency Services, 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, with Phase 2 detailing the vulnerability assessment process.


The City of Beverly Hills Climate Change Vulnerability Assessment is prepared consistent with Phase 2 of the Cal APG, and is composed of the following four parts:

1. **Community Sensitivities.** Beverly Hills populations and assets most at risk to climate change.
2. **Anticipated Impacts.** The nature and degree to which different aspects of the community will be affected by changes in temperature and precipitation, and wildfire.

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3. **Adaptive Capacity.** Beverly Hills’s ability to cope with extreme events, to make changes, or to transform to a greater extent, including the ability to moderate potential damages and to take advantage of opportunities.

4. **Vulnerability.** The overall risk of potential impacts to different aspects of the community, given their adaptive capacity.

**Stakeholder Engagement**

The stakeholder engagement process for developing the City of Beverly Hills Climate Change Vulnerability Assessment included asset manager interviews, Advisory Committee meetings, and community meetings as detailed below.

**Asset Manager Interviews**

Interviews were conducted with the following asset managers to inform the development of the City of Beverly Hills Climate Change Vulnerability Assessment:

- City of Beverly Hills Office of Emergency Management
- City of Beverly Hills Police Department
- City of Beverly Hills Fire Department
- City of Beverly Hills Community Services
- City of Beverly Hills Public Works Department
- Southern California Gas Company (SoCalGas)
- Southern California Edison (SCE)

The interviews identified information related to past climate impacts, potential impacts climate change could have on managed assets, and policies and programs in place that seek to increase Beverly Hill’s ability to cope with climate change.

**Advisory Committee**

The City of Beverly Hills convened a Climate Action and Adaptation Plan Community Advisory Committee (CAC) to provide dedicated community members with the opportunity to participate in the development of the Climate Action and Adaptation Plan. The CAC was appointed by the City of Beverly Hill’s City Council and consists of 10 members of the City’s various appointed commissions and five community members. The CAC provided input on the City of Beverly Hills Climate Change Vulnerability Assessment in April 2022. The CAC offered critical local context for identifying and analyzing climate change hazards of concern, community vulnerabilities, and current resilience and adaptation efforts. CAC feedback was integrated throughout this assessment and was used to facilitate the prioritization of the Climate Action and Adaptation Plan resilience and adaptation measures and actions.
Community Events

The City of Beverly Hills held several community events to solicit input on the Climate Action and Adaptation Plan process. Community events and the input received from the public related to climate hazards included:

- Earth Day Pop-up (April 24, 2022) - CAC members, City staff, and the consultant team hosted an Earth Day pop-up at the Beverly Hills Farmers Market to provide community members with information on the Climate Action and Adaptation Plan process and an opportunity to give feedback or ask questions about the City’s climate mitigation and adaptation planning efforts.
- Community Workshop (May 25, 2022) – CAC members, City staff, and the consultant team held a virtual community workshop to provide community members with an overview of the Climate Action and Adaptation Plan development process, potential climate mitigation and adaptation strategies, and implementation approaches.
- Movie Night Event (June 20, 2022) – CAC members and City staff hosted a movie night at Roxbury Park to raise awareness about the Climate Action and Adaptation Plan development process through the showing of the film Ice on Fire and facilitation of a panel discussion on climate mitigation and adaptation measures the City is considering adopting.

Relevant Plans and Tools

The City of Beverly Hills Climate Change Vulnerability Assessment builds on a variety of climate research, plans and tools. Key plans and tools include:

- California’s Fourth Climate Change Assessment, Los Angeles Region Summary Report. This report presents an overview of climate science, 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.
- Southern California Adaptation Planning Guide. This guide was prepared by the Southern California Association of Governments (SCAG) and outlines a general process of adaptation planning in alignment with the Cal APG. It identifies case studies and best practice examples from SCAG member jurisdictions to illustrate each phase in the adaptation planning process. It also references and provides guidance on the use of data and tools that have been specifically developed for adaptation planning in the SCAG region.
- Los Angeles Climate Change Vulnerability Assessment (CVA). The LA County CVA assess how people and infrastructure in Los Angeles County, including incorporated cities, may be vulnerable to the changing climate. The CVA evaluates potential changes in the frequency and severity of extreme heat, wildfire, extreme precipitation and inland flooding, coastal flooding, and drought and identifies populations and areas that are highly vulnerable. It also examines how physical infrastructure and facilities could experience damage from climate change. It also evaluates how infrastructural systems rely on one another and how harms to one type of infrastructure can affect other facilities, related services, and the people who rely on those services. It also conducts a social vulnerability assessment by examining the level of risk across communities and populations and identifies groups and places that are highly vulnerable to climate hazards.
- City of Beverly Hills Local Hazard Mitigation Plan 2017-2022. The Local Hazard Mitigation Plan provides a list of activities that may assist the City in reducing risk and preventing loss from future events. It also includes information that can assist City Departments, residents, public and private sector organizations, and others in participating in planning for disasters. It promotes
public policy and programs designed to protect the public, critical facilities, infrastructure, private and public property, and the environment from natural and human-made hazards.

- **City of Beverly Hills Safety Element Update (Draft).** The City of Beverly Hills Safety Element establishes goals and policies to increase emergency preparedness and reduce risk and impacts associated with natural and human-made hazards. As part of the update to the Safety Element, a climate change vulnerability assessment was prepared that evaluates ten climate-related effects and hazards applicable to the City of Beverly Hills: air quality, precipitation changes, flooding, severe rainstorms, extreme weather, Santa Ana winds, landslides, extreme heat days, cooling degree days and wildfire.

- **Cal Adapt.** Cal-Adapt is an online tool that provides modeled projections of how climate change might affect Beverly Hills. The Local Climate Change Snapshot tool in Cal-Adapt shows climate projections for temperature, precipitation, and wildfire.

- **Center for Disease Control/ATSDR Social Vulnerability Index (SVI).** This tool quantifies the social vulnerability of populations at risk to natural disasters and public health threats at the census tract level, based on four themes of social factors: Socioeconomic status, Household Composition and Disability, Minority Status and Language, and Housing and Transportation.
Community Sensitivities

Communities will be affected by climate change to varying degrees depending on how sensitive the communities are to impacts and the severity of the impacts. While all people, facilities, and services in a community will experience climate change, some may be more affected than others. For example, individuals living with disabilities may be more at-risk to heat illness during an extreme heat event. Sensitivity to climate hazards can be influenced by several factors. The following section identifies specific groups and types of built and natural assets that are sensitive to climate hazards and the specific underlying factors that are associated with their sensitivity.

Community sensitivities are grouped under the following community asset categories:

- Populations
- Transportation
- Critical Infrastructure

Populations

The vulnerability of Beverly Hills’ population is analyzed using the Center for Disease Control/ATSDR Social Vulnerability Index (SVI). The SVI was developed to rank census tracts based on 15 variables (e.g., poverty, lack of vehicle access, crowded living conditions), and groups the variables into the following four themes:

1. Socioeconomic status
2. Household composition and disability
3. Minority status and language
4. Housing and transportation

The SVI then generates maps (included below) with rankings based on each of the four themes, as well as a map that provides an overall social vulnerability score based on the 15 variables.

**Overall Social Vulnerability Index Score**

The City’s population has low social vulnerability based on all 15 variables in the SVI. Of the seven census tracts in Beverly Hills, a majority have a total SVI score below the 25th percentile statewide. This indicates that the population in these tracts has a lower SVI score than 75% of the tracts in the state. The two census tracts directly north of Wilshire Blvd (Tracts 7008.01 and 7008.02) have higher scores but are still below the state average, in the 43rd and 31st percentiles respectively (See Figure 1).

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8 The most recent version of the CDC/ATSDR SVI Index is from 2018. It does not reflect 2020 Decennial Census data.
These scores indicate that all the census tracts in Beverly Hills are less vulnerable to climate change impacts than other communities in California. This means that the population of Beverly Hills have a high capacity to prepare for, respond to, and recover from climate change impacts.

**Figure 1 Beverly Hills Overall Social Vulnerability Index Score**

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**Socioeconomic Status**

Overall, the population of Beverly Hills has low social vulnerability related to socioeconomic factors. Indicators in this theme are households below poverty, unemployment, income, and educational attainment (indicated by no high school diploma). Of the seven census tracts in the city, five are below the 25th percentile statewide (See Figure 2). In fact, census tract 7007.00 is in the 4th percentile, meaning it is one of the most socioeconomically advantaged tracts in the state. Census tracts 7008.01 and 7008.02 have the highest scores in the City but are still below the statewide average (35th and 34th percentile respectively).

According to the American Community Survey (ACS) 2015-2019 5-year estimates, the median income in Beverly Hills is $108,166. Only 8.3% of the population was below the federal poverty level and only 6% of the civilian labor force aged 16 years or older are unemployed. Although only a small proportion of Beverly Hills is below the poverty line, the City should direct resources,

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12 US Census Bureau. ACS 15-19 5-Year Estimates: Table A14006

13 US Census Bureau. ACS 15-19 5-Year Estimates: Table S1701

14 US Census Bureau. ACS 15-19 5-Year Estimates: Table A17005
both financial and technical, to those communities in order to help them adapt to the impacts of climate change.

The most straightforward way socioeconomic status affects disaster is related to income or assets. Households with lower incomes may not have the funds to prepare their home for climate change hazards, or the ability to recover if their home gets damaged. Lower income and unemployed populations are also less likely to have access to healthcare, leading to a higher incidence of chronic conditions (such as heart and pulmonary conditions) which put them more at risk of health effects from heat and wildfire. As indicated by the high median income, low poverty rate, and low unemployment in Beverly Hills, there are not many households that will experience these challenges.

**Figure 2 Beverly Hills Socioeconomic Status Score**

Household Composition and Disability

Household composition and disability is the SVI theme where the Beverly Hills population is most impacted. This theme accounts for people who are aged 65 and older, aged 17 or younger, older than age 5 with a disability, and single-parent households. Census tracts 7006.00 ranks in the 71st percentile and 7008.01 ranks in the 53rd percentile for this category (See Figure 3).\(^\text{15}\) According to

ACS 2015-2019 5-year estimates, 21.4% of the Beverly Hills population is 65 years and older,\textsuperscript{16} while 20.3% are under 18 years old.\textsuperscript{17} Approximately 8.7% of the population is disabled.\textsuperscript{18}

Older adults, children, and people with a disability are physiologically and socially more vulnerable to extreme events or climate stressors. For example, older adults and people with a disability may have reduced mobility, communication abilities, and/or mental functioning which could make it difficult to evacuate (for example in a wildfire, flood, or landslide) or understand and/or carry out preparedness measures in their homes. They may also depend on medical devices which could be impacted during preventative power shut offs or climate hazard events. Furthermore, older adults are more likely to have chronic illnesses (such as heart and pulmonary conditions) that increase the risk of heat illness and medical problems from wildfire smoke.

Children, particularly younger ones, are socially vulnerable because they do not have the resources or knowledge to cope with climate change hazards. They are typically dependent on their parents or other adults to keep them safe and healthy. Physical characteristics (such as the fact that they are still growing, their smaller size, the way they regulate body temperature) also put them more at risk of health effects from heat and wildfire.\textsuperscript{19}

The CDC SVI includes single-parent households as a Household Composition variable because they are typically more socially vulnerable than two-parent households. The first reason is that they typically have lower socioeconomic status, however, the results of the SVI socioeconomic analysis (Figure 2) indicate that is not relevant in Beverly Hills. The second reason is because one parent has all the responsibility of their family in a disaster situation.\textsuperscript{20} This applies regardless of the household’s income.

\textsuperscript{16} US Census Bureau. ACS 15-19 5-Year Estimates: Table A01001
\textsuperscript{17} Ibid.
\textsuperscript{18} US Census Bureau. ACS 15-19 5-Year Estimates: Table S1810
Figure 3  Beverly Hills Household Composition and Disability Score
Minority Status and Language

The population of Beverly Hills has low social vulnerability in this category, which accounts for minority status and linguistic isolation (those who speak English less than well). According to ACS 2015-2019 5-year estimates, 32.2% of the Beverly Hills population identifies as a race other than Non-Hispanic or Latino White Alone. However, six of the seven census tracts in the city rank below the 25th percentile statewide (see Figure 4). The highest scoring tract in the city is 7008.01, which is in the 47th percentile. Although there is a sizable minority population in Beverly Hills, only a small proportion of that population faces linguistic challenges or isolation.

Historic and current day social and economic marginalization makes populations of color more vulnerable to the impacts of climate change. Of course, race and ethnicity are connected to all three of the other SVI categories. Populations who are not proficient in English may have limited access to information and resources. Because of a lack of culturally relevant content, they may not fully understand climate hazards, preparedness actions, or emergency communications. However, this is not particularly relevant in Beverly Hills, as evident in the low SVI scores.

Figure 4 Beverly Hills Minority Status and Language Score

Housing and Transportation

The Housing and Transportation SVI theme accounts for multi-unit structures, mobile homes, crowding, households with no vehicle, and group quarters. Census tracts 7006.00, 7007.00, 7009.01, and 7010.00 rank below the 25th percentile statewide. Census tracts 7008.01, 7008.02, and 7009.02

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21 US Census Bureau. ACS 15-19 5-Year Estimates: Table A04001
are closer to the state average (with scores in the 47th, 46th, and 33rd percentile respectively) (see Figure 5).

According to ACS 15-19 5-year estimates, only 8.2% of housing units citywide have no vehicle. Not having access to a vehicle in areas that lack nearby, reliable, frequent and convenient transportation alternatives can make evacuation more difficult, but this does not appear to be a major issue in Beverly Hills. Also, though it is not included as a metric in the SVI, 58.5% of the city’s housing units are renter occupied. Renters do not have as much agency as homeowners to make changes to their homes to help them be more resilient, such as installing a cool roof or solar backup power.

Homes that are well-constructed are better at protecting inhabitants from climate stressors and extreme events. For example, having better insulation and air conditioning reduces the effects of extreme heat. Or a stick-built home is likely to sustain less damage from a flood than a mobile home. Overall, Beverly Hills is not vulnerable in relation to housing and transportation. Housing quality is connected to socioeconomic status and race and ethnicity, which are SVI categories where Beverly Hills scores well compared to the state. However, the three census tracts with higher scores may still reflect historic real estate discrimination. Census tracts 7008.01, 7008.02, and 7009.02 align with areas ranked C “Definitely Declining” or Industrial by historic redlining maps.

Figure 5  Beverly Hills Housing and Transportation Score

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22 US Census Bureau. ACS 15-19 5-Year Estimates: Table A10030
23 US Census Bureau. ACS 15-19 5-Year Estimates: Table A10060
Community Sensitivities

Transportation Assets

The following are assets critical to the movement of goods and people into and out of Beverly Hills. When transportation assets are impacted by climate-change related impact (e.g., flooding, wildfire), portions of the city may not be able to evacuate in a timely manner. Emergency responders may not be able to provide essential services. Community members who are reliant on public transportation may be unable to evacuate if public transportation assets are impacted. Impacts to transportation assets can also disrupt the ability for workers to access their jobs, which can disrupt the operation of essential services.

Roadway network

Access roads provide entry to and exit from communities and neighborhoods. Disruption to access roads can effectively prevent large numbers of people from evacuating in a timely fashion and limit access for emergency responders. Designated disaster routes in Beverly Hills include Santa Monica Boulevard, North Beverly Boulevard, and Olympic Boulevard. Disaster routes are routes pre-identified for use by emergency personnel, not to move affected population out of an impacted area. Designated evacuation routes for use by Beverly Hills residents affected by wildfire events include Sunset Boulevard, Benedict Canyon Drive, San Ysidro Drive, Lexington Road, North Beverly Hills Drive, Coldwater Canyon Drive, Schuyler Road, Doheny Road, Loma Vista Drive, Carla Ridge, and North Hillcrest Road.

Public Transportation

The Los Angeles County Metropolitan Transportation Authority (Metro) provides several local and rapid bus lines through the City of Beverly Hills. The Purple Line Extension, a heavy rail subway corridor, is under construction and will include transit stations at Wilshire/La Cienega and Wilshire/Rodeo in 2024 and 2025 respectively. These stations will enable Beverly Hills residents to connect to Downtown Los Angeles, Westside cities, and various regional transportation hubs.

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Critical Infrastructure

The following are infrastructure assets and services identified as critical in the City of Beverly Hills Local Hazard Mitigation Plan 2017-2022. Critical infrastructure includes power, water, and wastewater utilities, transportation facilities and services, government and community facilities and services, and high occupancy structures. Critical infrastructure is of particular concern because it plays a role in providing essential services to the Beverly Hills community and are necessary to preserve the general welfare and quality of life. They also serve to fulfill important public safety, emergency response, and disaster recovery functions.

Electrical Utility Lines/Energy Delivery

Southern California Edison (SCE) delivers and transmits electricity to the City. The City has both underground and overhead electrical utility lines. The majority of underground electrical utility lines are located north of Sunset Boulevard, in the Very High Fire Hazard Severity Zone. Electrical lines are susceptible to wildfire impacts, which can cause short to long-term disconnection from electricity and limit the city and community from operating critical infrastructure and equipment.

Natural Gas Transmission Pipelines

Natural gas pipelines operated by SoCalGas carry large volumes of natural gas between communities. There are high-pressure distribution lines in the City. Natural gas pipelines are located underground and are only at-risk of rupture in the case of a landslide event. Most natural gas pipelines in the city are located south of Santa Monica Boulevard and outside landslide hazard zones; however, there are some north of the city that may be impacted by landslides. Should natural gas pipelines leak or explode, for example due to an earthquake, impacts could involve property damage and hazardous materials spill.

Communication Networks

The City of Beverly Hills contains higher averages of households with a computer, and broadband internet subscriptions than the national average, and higher than average senior populations with computer access. Broadband internet is provided by 9 different residential services with approximately 91 to 100 percent coverage of all households accounted for within the city boundaries. Internet failure and subsequently communication network failure could occur under a power outage-related incident.

Wastewater Conveyance and Treatment

The City of Beverly Hills is responsible for the wastewater conveyance system within city limits. Wastewater is treated at the City of Los Angeles Hyperion Treatment Plant, which is located outside

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Community Sensitivities

Beverly Hills. Flooding may disrupt or damage wastewater infrastructure with associated service and business interruptions and potential releases of untreated wastewater.

Water Conveyance and supply

The City of Beverly Hills provides domestic drinking water to parts of West Hollywood and all Beverly Hills residents as part of City services. Beverly Hills imports approximately 90 percent of its drinking water from MWD. The remaining 10 percent is produced locally from six municipal wells and are treated in the City’s reverse osmosis water treatment plant. One additional well site will be in the La Brea Subarea of the Central Groundwater Basin in 2022. These new sites will supply 20 to 25 percent of the City’s water demand after conservation, providing limited alternatives to water supplies from MWD.

Stormwater Infrastructure

The City of Beverly Hills owns and operates a stormwater collection system. Catch basin cleaning is based on year-round inspection. The inspection and maintenance workflow system has prevented the buildup of leaves and sediments in City-owned catch basins. Urban and storm water runoff flows to a regional system owned and operated by the Los Angeles County Department of Public Works Flood Control District. More frequent and intense precipitation can overwhelm stormwater infrastructure and cause backups that lead to localized flooding and greater runoff of contaminants into local waterways.

Parks and Recreation Facilities

Beverly Hills has approximately 77 acres of developed parkland and close to 100 acres of open space area. Additional recreational resources include community centers, clubhouses, the Greystone Mansion, the Beverly Hills Farmers’ Market, school district field sites, and private recreational facilities, including the Beverly Hills Tennis Club, numerous health clubs and spas, and nearby golf courses. Parks and recreation facilities could be impacted by changes in temperature, extended drought conditions, floods, and wildfires. Degraded air quality from regional wildfires could impact outdoor recreation.

Schools

Educational facilities include schools affiliated with the Beverly Hills Unified School District, including four elementary schools, one high school and one adult school, along with numerous private schools.

High Occupancy Structures

High occupancy structures, including hotels, office, and residential buildings, are essential to the well-being of Beverly Hills. After a disaster, hotels in the City may be a critical asset in allowing residents to remain within the city. Beverly Hills is home to 5 large hotels having occupancies of more than 500 persons per day, 35 high-rise buildings, and a densely populated retail and commercial district.37

Community Facilities and Government Buildings

Community and government facilities, such as libraries, government buildings, and community centers, are public properties and are important to the residents as well as the operation of the City. Notable community facilities and government buildings of Beverly Hills include libraries, and public safety facilities such as the fire and police departments. These facilities could be impacted by power outages induced by extreme weather or damaged by wildfires or landslides.

Anticipated Impacts

Climate change is projected to continue affecting Beverly Hills and the greater Los Angeles County region in the form of increasing average temperatures and extreme heat days, altered precipitation patterns, and greater wildfire risk. These impacts are expected to influence health and prosperity through decreased water availability, increased frequency and intensity of storms, extended drought conditions, and decreased air quality due to regional wildfires. Climate risks and impacts vary depending on location. Understanding local climate risks and impacts allows communities to prepare for the future and increase their resilience. Beverly Hill’s projected climate change impacts are based on information gathered from Cal-Adapt, the Los Angeles Summary Report of California’s Fourth Climate Change Assessment, the City’s Local Hazard Mitigation Plan, and concerns raised by asset managers in Beverly Hills.

Cal-Adapt provides modeled projections of how climate change might affect Beverly Hills. The Local Climate Change Snapshot tool in Cal-Adapt shows climate projections for temperature, precipitation, and wildfire. It is based on IPCC, which has established several future GHG emissions scenarios and associated global warming scenarios. Two of these GHG scenarios are commonly used to compare possible futures and have been selected for this assessment:

- The Representative Concentration Pathway (RCP) 4.5 represents a “medium emissions” scenario in which GHG emissions peak around 2040 and then decline at the end of the century. This scenario assumes global agreement and implementation of aggressive GHG reduction strategies.
- RCP 8.5 represents a “high emissions” scenario in which emissions continue to rise throughout the 21st century.

Increased Temperature

Average Minimum and Maximum Temperature

Since 1901, average temperatures across the country have increased, with eight of the top ten warmest years on record having occurred over the past 30 years.38 Average trends are increasing at both the local scale and the global scale.

Compared to the modeled historical 30-year average (1961-1990), average maximum temperatures in Beverly Hills are expected to rise between 4.2°F Fahrenheit (F) and 7.1°F by the end of the century, depending on the emissions scenario. In addition, average minimum temperatures in the City are expected to rise between 4.1°F and 7.0°F by the end of the century. The projected warming of average minimum and maximum temperatures, as well as more frequent temperature extremes, may have a variety of effects on the Beverly Hills community.

- Water and energy prices are likely to increase due to greater demand for both.
- Increased demand for water and energy will put additional stress on supplies and could lead to disruption in service.
- Local public health may be negatively impacted, due to increases in heat-related illnesses, with a disproportionate impact on vulnerable populations.

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38 United States Environmental Protection Agency (EPA). 2021. Climate Change Indicators: Weather and Climate
Increased frequency in damage to roadway systems resulting in higher maintenance costs
- Endangered species and ecosystem functions in the region may be impaired due to the change in average temperatures.

Figure 6 shows average maximum temperatures in Beverly Hills based on the RCP 4.5 (medium emissions) and RCP 8.5 (high emissions) emissions scenario. The purple line shows high emissions scenario (RCP 8.5), the blue line shows the medium emissions scenario (RCP 4.5), and the grey line illustrates the current trend (observed). The shaded areas indicate the range for the emissions scenario. For example, the blue shaded area represents the range of data for the medium emissions scenario (RCP 4.5).

**Figure 6  Historical and Projected Maximum Temperatures in Beverly Hills**

![Graph showing historical and projected maximum temperatures in Beverly Hills](image)

**Extreme Heat Events**

Beverly Hills is projected to experience more extreme heat conditions. An extreme heat day in Beverly Hills occurs when temperatures exceed 92.2°F. Compared to the modeled historical 30-year average (1961-1990), the annual number of extreme heat days is projected to increase by 8 to 15 days by the end of the century depending on the emissions scenario.

From 1961 to 1990, the modeled historical average number of days in the longest heat wave was 2.2 days. By the end of century, the high emissions scenario projects the average number of days in the longest heat wave to be 6.2.

Increased frequency and length of extreme heat days will result in increased public health risks, particularly to vulnerable populations like older adults and individuals with physical disabilities, through heat-impacted diseases, air quality degradation, and increased vector-borne illnesses. Figure 7 shows the number of extreme heat days in Beverly Hills for the medium and high emissions scenarios.
Impacts from Increased Temperature

Table 1 summarizes the potential impacts that increased temperature and extreme heat events might have on Beverly Hills’s population, transportation, and critical infrastructure assets.

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### Table 1  Potential Impacts from Increased Temperature

<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals with Respiratory Disease</td>
<td>Higher temperatures are linked to respiratory problems, in part because they cause a buildup of air pollutants. This puts people with chronic respiratory illnesses at risk of adverse health impacts. One measure of respiratory disease prevalence is that there are 18.86 ER visits per 10,000 people in Beverly Hills.</td>
<td>43 Centers for Disease Control and Prevention. N.d. Extreme Heat can Impact our Health in Many Ways. Available: <a href="https://www.cdc.gov/climateandhealth/pubs/EXTREME-HEAT-Final_508.pdf">https://www.cdc.gov/climateandhealth/pubs/EXTREME-HEAT-Final_508.pdf</a></td>
</tr>
<tr>
<td>Populations with Lower Socioeconomic Status</td>
<td>Households with lower socioeconomic status are more at risk of heat stress and/or high temperature mortality. Having access to air conditioning contributes to people’s ability to withstand high temperatures. Lower income households may not have air conditioning in their dwellings, or if they do, they may not be able to afford running it. Additionally, individuals without a high school diploma are more likely to work in outdoor occupations where they are more exposed to high temperatures.</td>
<td>44 Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews. 45 Los Angeles County of Metropolitan Transportation. 2019. Metro Climate Action and Adaptation Plan 2019. Available: <a href="https://media.metro.net/projects_studies/sustainability/images/Climate_Action_Plan.pdf?#page=35">https://media.metro.net/projects_studies/sustainability/images/Climate_Action_Plan.pdf?#page=35</a>. Accessed October 22, 2021.</td>
</tr>
</tbody>
</table>
## Anticipated Impacts

<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Utility Lines</td>
<td>Indirect impacts to electrical utility lines could occur from increased use of the system from running air conditioners, leading to power outages in the City. Long periods of intense heat may result in increased use of electricity for home cooling purposes that could tax the overall electrical system and result in electricity restrictions or blackouts. Energy prices are likely to increase, due to greater demand for air conditioning in the region and could put additional stress on energy supply. However, because more than 65% of residents in Beverly Hills already have air conditioners, the grid is not likely to be taxed by increases in cooling. SCE takes into consideration the need for air conditioning use over multiple consecutive days and nights during heat waves. Because SCE is required to purchase electricity based on heat wave projections, the risk of air conditioners over-burdening the grid is low.</td>
<td></td>
</tr>
<tr>
<td>Natural Gas Transmissions</td>
<td>Minimal impacts expected, given that natural gas transmission lines are underground.</td>
<td></td>
</tr>
<tr>
<td>Communication Network</td>
<td>Communication networks may be adversely impacted by increased temperatures, necessitating the need for backup power and/or a backup plan for communication networks should they fail during an extreme heat event. Internet failure and subsequently communication network failure could occur under a power outage-related incident. Temperature alone is not expected to impact communication networks.</td>
<td></td>
</tr>
<tr>
<td>Wastewater Conveyance and Treatment</td>
<td>Water conveyance systems are generally underground and treatment systems are generally insulated or unaffected by heat. Thus, minimal impacts expected.</td>
<td></td>
</tr>
<tr>
<td>Water Conveyance and Supply</td>
<td>High temperatures would contribute to a reduced water supply through longer periods of increased demand, evaporation and could result in decreased potable water supply for the city. Increased temperature can also cause degradation of water quality, which may force the City to flush it out of the system, causing more water wasting. The City is implementing new technology to maintain water quality and only flush out the system as a last resort. As mentioned, increased temperatures may increase the number of unexpected power outages in the City affecting the water treatment and distribution system. Therefore, the City will use its diesel-powered generators more often which can emit GHG emissions in the surrounding areas and impact local air quality. The City is looking into energy storage at critical facilities to increase redundancy.</td>
<td></td>
</tr>
<tr>
<td>Stormwater Infrastructure</td>
<td>Increased temperatures may increase the growth of vectors in the storm drain system. It can also deteriorate surface structures like catch basins.</td>
<td></td>
</tr>
<tr>
<td>Park and Recreation Facilities</td>
<td>Increased temperatures can cause vegetation stress and algal blooms in ponds. Indirect impacts could include increased watering and related</td>
<td></td>
</tr>
</tbody>
</table>

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47 Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews.
48 Ibid
50 Ibid.
Sensitivity Type | Sensitivity | Potential Impacts |
--- | --- | --- |
 |  |  | costs. Increased temperatures could also impact summer recreation and community programing resulting in economic loss for the City.  

Schools | Increased temperatures are likely to result in minimal direct impact to schools. An indirect impact is increase cooling costs to operate buildings with air conditioning. |

High Occupancy Structures | Increased temperature is likely to result in minimal impact to high occupancy structures. Heat could increase cooling costs for high occupancy structures. |

Community Facilities and Government Buildings | Increased temperatures are likely to result in minimal impact. Indirect impacts could be an increase in cooling costs. |

### Variable Precipitation

A warming climate is likely to influence the frequency and intensity of storms. Both increased temperatures and altered precipitation patterns can lead to altered seasons and intense rainstorms in Beverly Hills. By the end of the century, most areas in the Los Angeles region are expected to see an increase in the wettest day of the year, with some locations experiencing up to 30 percent increases under RCP 8.5.  

Projections show that Beverly Hills may experience an increase of 0 to 0.2 inches of annual average precipitation between 2070 and 2099 compared to the modeled historical data from 1960-1990. Overall, the projections show no clear or consistent trends during the next century. However, even small changes in average precipitation can lead to significant impacts on the water supply and storm flooding. Figure 8 shows annual projected precipitation in Beverly Hills.

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51 Ibid.  
52 Ibid.
Drought

Droughts occur when there is a period of unusually persistent dry weather with below-average rainfall. Drought severity depends upon the degree of moisture deficiency, the duration, and the size of the affected area. Drought is a regional and state-wide hazard and will impact the area in and surrounding Beverly Hills.53

Southern California is prone to periods of extremely dry conditions. The region recently experienced an exceptional drought during 2011-2015, with climate change contributing to historically warm temperatures, dry soils, precipitation deficits, and low snowpack.54 Climate change is projected to increase the probability that low precipitation years will coincide with above-average temperature years.55 This increases the likelihood of drought due to decreased supply of moisture and increased atmospheric demand for moisture as evaporation from bare soils and evapotranspiration from plants increase. Global climate models project significantly drier soils in the future over the Southwest and the West (including California), with more than an 80% chance of a multidecadal drought during 2050-2099 under the high emissions scenario.56

---

55 Ibid.
56 Ibid.
In addition to evidence of increased drought severity, there is evidence for occasional wet years. Because precipitation is projected to be variable, some years will be less drought-prone than others due to more frequent and possibly stronger storms. However, even with more frequent intense storms, California’s water systems are not currently designed to capture and store runoff from projected storms which then implies that more water could be lost to the ocean and increase the possibility of drought.\textsuperscript{58}

**Heavy Precipitation Events**

Increased temperatures and altered precipitation patterns can lead to altered seasons and intense and heavy rainstorms in Beverly Hills. California’s Fourth Climate Change Assessment projects more extreme precipitation events will occur throughout the Los Angeles region. Climate change may cause low-lying areas throughout Beverly Hills to experience more frequent flooding and increase the extent of 100-year floods. However, since the implementation of the Holly Hills Mitigation Storm Drain Project, flooding risk has been reduced in the city. Due to Beverly Hills’ proximity to mountainous terrain and geographical layout, the city may be impacted by flood events in the future.\textsuperscript{59} Heavy precipitation events, especially those followed by wildfires, may increase landslides in areas of the city that are already susceptible to landslides. Critical infrastructure potentially impacted by landslides are listed in Table 2 and mapped in Figure 9.

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\textsuperscript{58} Ibid.

### Table 2  Critical Infrastructure in Landslide Susceptibility Areas

<table>
<thead>
<tr>
<th>Map Object ID (See Figure 9)</th>
<th>Facility</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Fire Station No. 2</td>
<td>1100 Coldwater Canyon Dr</td>
</tr>
<tr>
<td>15</td>
<td>Beverly Hills High School &amp; District Office</td>
<td>241 Moreno Dr</td>
</tr>
<tr>
<td>17</td>
<td>El Rodeo School</td>
<td>605 Whittier Dr</td>
</tr>
<tr>
<td>22</td>
<td>Coldwater Preschool at Coldwater Park</td>
<td>1100 N Beverly Dr</td>
</tr>
<tr>
<td>38</td>
<td>Reservoir No.7 &amp; Radio Towers</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>39</td>
<td>Reservoir No.6</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>40</td>
<td>Reservoir No.5</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>41</td>
<td>Reservoir No.4B</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>42</td>
<td>Greystone Reservoir (Pump Station)</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>43</td>
<td>Reservoir No.4A-9398 Readcrest</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>44</td>
<td>Reservoir No.3A-Loma Vista</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>45</td>
<td>Coldwater Reservoir</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>47</td>
<td>Woodland Reservoir (Booster Station No.2)</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>53</td>
<td>Coldwater Canyon Park</td>
<td>1100 Coldwater Canyon Dr</td>
</tr>
<tr>
<td>54</td>
<td>Greystone Park</td>
<td>905 Loma Vista Dr</td>
</tr>
<tr>
<td>55</td>
<td>Will Rogers Park</td>
<td>9650 Sunset Blvd</td>
</tr>
</tbody>
</table>
Figure 9  Critical Infrastructure in Landslide Susceptibility Areas
Impacts from Change in Precipitation Patterns

Table 3 summarizes potential impacts of drought and heavy precipitation events on Beverly Hills’s populations, transportation, and critical infrastructure assets.

Table 3  Potential Impacts from Changes in Precipitation

<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Populations with Lower Socioeconomic Status</td>
<td>Lower income individuals may not be able to take on additional expenses such as repeated home repair or flood proofing that could be required due to extreme precipitation. Additionally, lower educational attainment (indicated by no high school diploma) can result in insufficient understanding of preparedness information for flooding risks.</td>
</tr>
<tr>
<td>Minority and Linguistically Isolated Populations</td>
<td>During flooding events, individuals from these groups may have limited access to information and resources because of language or cultural differences.</td>
</tr>
<tr>
<td>Roadway Network</td>
<td>Flooding can cause streets in Beverly Hills to deteriorate faster, causing potholes and rutting in high traffic areas. Flooding (and landslides caused by heavy precipitation events) can also damage or close roads, isolating parts of the City. Although there could be localized flooding from storms, the City’s mitigation projects have reduced flood risk.</td>
</tr>
<tr>
<td>Public Transportation</td>
<td>Buses and bus service may be impacted by flooded roads in the event of a high precipitation event.</td>
</tr>
<tr>
<td>Electrical Utility Lines</td>
<td>Electrical utility lines in the Very High Fire Hazard Severity Zones are underground, and therefore less susceptible to climate impacts such as stronger storms. However, both above and below-ground electrical utility lines north of West Sunset Boulevard may be at risk to potential landslide susceptibility, potentially disrupting service. There is some concern over private trees on the border of West Hollywood and Los Angeles and in alleys with above-ground electrical lines due to stronger storms or stress from drought.</td>
</tr>
<tr>
<td>Natural Gas Transmissions</td>
<td>High Pressure Distribution Lines lie right on the border of city limits and may be impacted by landslides, caused by heavy precipitation. Though not expected, major landslides could cause underground utilities to be disrupted and/or ruptured.</td>
</tr>
<tr>
<td>Communication Network</td>
<td>Increased precipitation may impact communication network infrastructure if power is lost, however, given that the electrical lines in the Very High Fire Hazard Severity Zone are underground, minimal impacts are expected. Using a 2.4 gigahertz (GHz) frequency (industry</td>
</tr>
</tbody>
</table>

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61 Ibid.
63 Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews.
64 Ibid.
65 Ibid.
66 Ibid.
<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater Conveyance &amp; Treatment</td>
<td>Flooding may disrupt or damage wastewater infrastructure with associated service and business interruptions and potential releases of untreated wastewater. 68</td>
<td>The City obtains water supply from Metropolitan Water District (MWD) and local groundwater. Approximately 90 percent of the City’s water comes from MWD. Currently, MWD has the capacity to feed the entire Beverly Hills system. To reduce reliance on MWD, the City has three emergency connections that can store 43 million gallons (seven days without disruption). In addition, the City is drilling in the La Brea subarea for more groundwater supply which will be available Summer 2022. This will give the City a total of seven wells. The City is also looking for two additional wells over the next five years to increase redundancy. Supply from these wells could serve up to 33 percent of City demand.</td>
</tr>
<tr>
<td>Water Conveyance and Supply</td>
<td>Typically, drought leads to increased water use which under certain circumstances could lead to increased price hikes which would disproportionately impact low-income families. 69 Drought may lead to less water available for a community, especially water used for landscaping.</td>
<td>The implementation of the Holly Hills mitigation project reduced flood risk in the city. However, intense flooding and landslides may disrupt or damage water supply infrastructure, impacting service. According to information gathered from the asset manager interviews, Beverly Hills’s storm drain facilities need updating due to the age and development after the stormwater system has been installed. 70 More frequent and intense precipitation can overwhelm stormwater infrastructure and cause backups that lead to localized flooding or greater runoff of contaminants into local waterways. 71</td>
</tr>
<tr>
<td>Stormwater Infrastructure</td>
<td>The implementation of the Holly Hills mitigation project reduced flood risk in the city. However, intense flooding and landslides may disrupt or damage water supply infrastructure, impacting service. According to information gathered from the asset manager interviews, Beverly Hills’s storm drain facilities need updating due to the age and development after the stormwater system has been installed. 70 More frequent and intense precipitation can overwhelm stormwater infrastructure and cause backups that lead to localized flooding or greater runoff of contaminants into local waterways. 71</td>
<td>Parks and Recreation Facilities Drought could impact irrigation and may indirectly increase wildfire risk. 72 In addition, heavy precipitation events could flood recreation facilities, impacting service. Schools Beverly Hills High School and District Office and the Coldwater Preschool at Coldwater Park, and some residential buildings are at risk of landslides. High Occupancy Structures The Beverly Hills Hotel is susceptible to landslides. Heavy precipitation could also deter visitors, resulting in economic losses to hotels and the City due to loss in tourism revenue.</td>
</tr>
</tbody>
</table>

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Anticipated Impacts

<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Potential Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Facilities and Government Buildings</td>
<td>Major facilities and governmental buildings impacted by landslides include Beverly Hills Fire Department Station #2. Emergency response systems could be affected by flooding through restricted access to and from emergency response facilities, such as the fire station.</td>
<td></td>
</tr>
</tbody>
</table>

Wildfire

Climate change can affect multiple elements of the wildfire system, including fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create the highest fire risk, and increased temperatures may intensify wildfire danger by warming and drying vegetation. As a result, the California Department of Forestry and Fire Protection (CAL FIRE) has identified Very High Fire Hazard Severity Zones (VHFHSZ) in Beverly Hills. The VHFHSZs includes the area north of West Sunset Boulevard. Critical infrastructure potentially impacted by wildfires in the VHFHSZ are listed in Figure 4 and mapped on Figure 10.

Though uncertainties exist in quantifying future changes of burned area in the region, projections indicate that the annual area burned in the Los Angeles Region may increase over 5,000 acres by mid-century. However, slightly lower increases in acres burned are projected by the end of the century, as continued warming (even with moderate precipitation increases) could lead to overall fuel declines necessary for wildfire.75

Recent Wildfire Events

Based on interviews with the City of Beverly Hills Fire Department and Community Services, wildfire events have impacted Beverly Hills. In 2007/2008, the Beverly Fire started in Los Angeles and traveled into Beverly Hills. The fire resulted in roadway closures along major arterials, affecting both workers and travelers. Historically, large-scale evacuation in response to wildfire risk in the City has not occurred. Beverly Hills has not experienced recent power safety shut offs associated with wildfires. The City works closely with SCE and SoCalGas to mitigate the potential for power shut offs.73

Though Beverly Hills has not suffered infrastructure damage from historical fires, fires in surrounding jurisdictions have impacted outdoor programming events due to adverse air quality, including farmers markets and outdoor summer camps.74

73 Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews.
74 Ibid.
<table>
<thead>
<tr>
<th>Map Object ID (See Figure 10)</th>
<th>Facility</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Fire Station No. 2</td>
<td>1100 Coldwater Canyon Dr</td>
</tr>
<tr>
<td>22</td>
<td>Coldwater Preschool at Coldwater Park</td>
<td>1100 N Beverly Dr</td>
</tr>
<tr>
<td>38</td>
<td>Reservoir No.7 &amp; Radio Towers</td>
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<td>39</td>
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<td>42</td>
<td>Greystone Reservoir (Pump Station)</td>
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<td>Reservoir No.3A-Loma Vista</td>
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<td>45</td>
<td>Coldwater Reservoir</td>
<td>Not publicly available</td>
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<tr>
<td>47</td>
<td>Woodland Reservoir (Booster Station No.2)</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>48</td>
<td>Green Acres Pump Station</td>
<td>Not publicly available</td>
</tr>
<tr>
<td>53</td>
<td>Coldwater Canyon Park</td>
<td>1100 Coldwater Canyon Dr</td>
</tr>
<tr>
<td>54</td>
<td>Greystone Park</td>
<td>905 Loma Vista Dr</td>
</tr>
</tbody>
</table>
Figure 10 Very High Fire Hazard Severity Zones

Legend:
- **City of Beverly Hills**
- **Local Responsibility Area**
- **Very High Fire Hazard Severity Zones**
  - Fire Station
  - Police Station
  - School
  - Other Public Facility

Base map provided by Esri and its licensors © 2021.
Impacts from Increased Wildfire Risk

Table 5 summarizes the potential impacts of increasing wildfire risk on Beverly Hills’s populations, transportation, and critical infrastructure assets.

Table 5  Summary of Potential Impacts from Wildfire

<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Impact Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Populations with Lower Socioeconomic Status</td>
<td>Lower socioeconomic status is correlated with less access to healthcare, which can mean higher rates of underlying health conditions which make them at risk of adverse effects from wildfire smoke. These households may also live in lower quality housing that lack the proper air filtration or insulation that can prevent exposure. Lastly, individuals with lower socioeconomic status are more likely to work in an outdoor occupation where they may be exposed to high concentrations of wildfire smoke.</td>
<td></td>
</tr>
<tr>
<td>Populations with Vulnerable Household Characteristics and Disability</td>
<td>Older adults tend to have a higher prevalence of lung and heart conditions which make them more likely to experience adverse health impacts from wildfire smoke. Children are also more at risk of lung problems related to smoke because their lungs are still developing and other physiological factors.</td>
<td></td>
</tr>
<tr>
<td>Individuals with Cardiovascular Disease</td>
<td>Wildfire smoke pollutes the air with fine particulate matter that may trigger severe cardiovascular events for people with underlying cardiovascular disease.</td>
<td></td>
</tr>
<tr>
<td>Individuals with Respiratory Disease</td>
<td>Wildfire smoke pollutes the air with fine particulate matter that may lead to breathing difficulties and trigger symptoms for people with chronic lung diseases including asthma and chronic obstructive pulmonary disease.</td>
<td></td>
</tr>
<tr>
<td>Minority and Linguistically Isolated Populations</td>
<td>During a wildfire, individuals from these groups may have limited access to information and resources related to evacuation because of language or cultural differences. Minority and linguistically isolated populations may also not have access to information and resources about how to prepare their family and/or property for wildfire, or how to access programs that can help them do so.</td>
<td></td>
</tr>
<tr>
<td>Roadway Network</td>
<td>Wildfires result in closure or the inability to travel on roads during wildfire events, which can isolate areas of the city and create severe health and safety risks. In addition, wildfires in neighboring jurisdictions can increase traffic in the city. Potential road closures and evacuation routes are major concern for the city. Coldwater Canyon Drive and Benedict Canyon Drive are major commuter-ways and closing these streets can have ripple effects and delay moving resources when responding to a fire.</td>
<td></td>
</tr>
<tr>
<td>Public Transportation</td>
<td>Increased wildfires are likely to result in minimal direct impact because all transit stops lie outside the VHFHSZ. However, wildfires in the surrounding</td>
<td></td>
</tr>
</tbody>
</table>

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77 Ibid.

78 Ibid.

79 Ibid.

80 Ibid.


82 Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews.
<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Impact Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Utility Lines</td>
<td>Electrical utility lines in the Very High Fire Hazard Severity Zone are underground, and therefore less susceptible to climate impacts such as wildfire. However, electrical system transformers may be vulnerable in hillside areas due to vegetation located near lines.83</td>
<td></td>
</tr>
<tr>
<td>Natural Gas Transmissions</td>
<td>Minimal impacts expected, given that natural gas transmission lines are underground.</td>
<td></td>
</tr>
<tr>
<td>Communication Network</td>
<td>Wildfires can create regional power outages either in anticipation or during such an event. Communication networks are required to have backup plans in place so residents may access 9-1-1 and 2-1-1 emergency related services across California. With the ever-changing landscape of wildfire externalities Beverly Hills may be susceptible to communication network outages during a wildfire due to safety power shutoffs and wildfire-caused power outages.84</td>
<td></td>
</tr>
<tr>
<td>Wastewater Conveyance and Treatment</td>
<td>Wastewater infrastructure may be damaged or destroyed by fire.85</td>
<td></td>
</tr>
<tr>
<td>Water Conveyance and Supply</td>
<td>Water supply to most areas of the City is very good, The Beverly Hills Fire Department has contingency plans to supply water to the City in case a catastrophic failure occurs in the water supply pumping system.86 Personnel that work in the field may face increased health risk during air quality emergencies.</td>
<td></td>
</tr>
<tr>
<td>Stormwater Infrastructure</td>
<td>Minimal impact for wildfires. Storm conveyance system can be impacted by wildfire debris during firefighting activities and cleanup.</td>
<td></td>
</tr>
<tr>
<td>Parks and Recreation Facilities</td>
<td>Parks in the City, especially those in the VHFHSZ including Coldwater Canyon Park and Greystone Mansion and Gardens, are at risk of increased wildfires caused by climate change. Wildfires in the area could impact events held at Greystone Mansion and Gardens, and programming, such as the pre-school program, at Coldwater Canyon Park, leading to economic loss.87</td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>The Coldwater Preschool at Coldwater Park lies in the VHFHZS. This school in may experience direct infrastructure damage from wildfire, and schools in the entire city could experience indirect impacts associated with wildfire smoke from fires in and surrounding the city.</td>
<td></td>
</tr>
<tr>
<td>High Occupancy Structures</td>
<td>Hotels and other high-occupancy buildings, such as residential buildings, in the VHFHSZ may be impacted by wildfire. Hotels throughout the city could be impacted indirectly by wildfires in the region if tourists are deterred from visiting.88</td>
<td></td>
</tr>
<tr>
<td>Community Facilities and Government Buildings</td>
<td>Major facilities and governmental buildings potentially impacted by wildfires include Fire Station 2 and water reservoirs.89 Public safety services will likely be strained during wildfire events. Coordinating agencies will likely be</td>
<td></td>
</tr>
</tbody>
</table>

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83 Ibid.
85 Ibid.
87 Ibid.
88 Ibid.
89 Ibid.
<table>
<thead>
<tr>
<th>Sensitivity Type</th>
<th>Sensitivity</th>
<th>Impact Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>similarly strained as fire seasons grow longer, and the intensity and extent of fires increases with climate change. Personnel that work in the field may face increased health risk during air quality emergencies.</td>
</tr>
</tbody>
</table>
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. Beverly Hills has actively taken steps to increase the City’s adaptive capacity. These include varying programs, plans and policies and are listed in Table 6, Table 7, Table 8, Table 9, and Table 10 below.

Increased Temperature

Table 6 lists programs, plans, and policies that help increase the community’s resilience to increased temperature and extreme heat.

**Table 6 Programs, Plans, and Policies to Manage Increased Temperature Impacts**

<table>
<thead>
<tr>
<th>Existing and Planned Programs, Plans, and Policies</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly Hills Office of Emergency Management (OEM), National Weather Service, and LA County Partnership</td>
<td>This program is in place to plan and prepare for climate impacts and extreme/adverse weather events. Beverly Hills OEM is responsible for disseminating information to key staff from all City departments so that mitigation measures can be put in place ahead of adverse weather events. City departments successfully execute a variety of mitigation measures (securing infrastructure, clearing storm drains, rearranging outdoor programming as necessary, etc.) when this information is shared. These measures will continue to be effective when adequate lead time is given, and projected impacts are able to be anticipated. However, with climate change, it is likely that local jurisdictions and communities will experience climate impacts never seen before.</td>
</tr>
<tr>
<td>City-led Outreach</td>
<td>The City conducts outreach through social media platforms, Nixle alert, Reverse 911 via text, call, and email, and press releases. The City can reach over 6,000 people through the reverse 911.</td>
</tr>
<tr>
<td>City-led Outreach to homeless population</td>
<td>Beverly Hills reaches out to the homeless population 5 mornings per week throughout the city including the commercial areas and public parks. They offer services and facilitate moving homeless individuals to available shelters which are located outside the City.</td>
</tr>
<tr>
<td>Beverly Hills Park Master Plan for La Cienega</td>
<td>This plan will provide additional recreation space for programs and seeks to augment indoor capacity in anticipation of increased temperatures.</td>
</tr>
<tr>
<td>Southern California Edison (SCE) Automated System</td>
<td>SCE regularly communicates with customers in the City during power outages and identifies when power will be restored.</td>
</tr>
<tr>
<td>Southern California Edison (SCE) Medical Baseline Program</td>
<td>SCE works with individuals with medical need for electricity (for oxygen, dialysis, etc.) to develop contingency plans. SCE regularly conducts marketing for medical needs for electricity. It is aimed at customers in high fire risk areas, low-income customers eligible for free battery back-up (whole home battery), solar incentives, and others.</td>
</tr>
</tbody>
</table>
Asset managers identified staffing, facility, and community preparedness constraints associated with increasing adaptive capacity for increased temperatures, as described below.

- Need to increase enrollment in the SCE Automated System.
- Need to investigate offsite clean energy fueling stations for waste hauling in case of disruptions.
- Cooling centers were prepared to be opened in the summers of 2020 and 2021; however, because no community members requested use of the facilities, they were not opened for use during high heat days in 2020 and 2021.
- Community Services Department staff indicated that the City has staffing capacity issues within the Community Service and Parks and Recreation divisions.

Variable Precipitation

Table 7 lists programs, plans, and policies that help increase the community’s resilience to flooding from more frequent and intense storms as well as extended drought.

**Table 7 Programs, Plans, and Policies to Manage Precipitation Impacts**

<table>
<thead>
<tr>
<th>Existing and Planned Programs, Plans, and Policies</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Energy Commission (CEC) Report on Natural Gas System and adaptation</td>
<td>This report evaluates scenarios that achieve an 80 percent reduction in California’s greenhouse gas emissions by 2050 from 1990 levels, focusing on the implications of achieving these climate goals for gas customers and the gas system.</td>
</tr>
<tr>
<td>Beverly Hills excessive water use policy</td>
<td>The City is exploring instituting this policy which would limit water use during drought conditions.</td>
</tr>
<tr>
<td>Moving infrastructure out of easements at risk of landslides</td>
<td>The City intends to move watermains out of hillsides and pipelines out to the public right of way.</td>
</tr>
<tr>
<td>Integrated Water Resources Master Plan (IWRMP)</td>
<td>This is a comprehensive medium term plan to improve the reliability of water, wastewater and stormwater systems. It also recommends expanding the City’s water resources to include non-potable source (stormwater and shallow groundwater) for non-potable use like irrigation.</td>
</tr>
</tbody>
</table>
Objective


This guidebook offers actions that communities can take to reduce flood losses. It also offers a table with sources for floodplain mapping assistance for the various types of flooding hazards. There is information on various types of flood hazards with regard to existing mitigation efforts and options for action (policy and programs, mapping, regulatory, non-regulatory). Types of flooding which are covered include alluvial fan, areas behind levees, areas below unsafe reservoirs, coastal flooding, flash floods, fluctuating lake level floods, ground failure triggered by earthquakes, ice jam flooding, and mudslides.

Separate meters for irrigation

Incentivizes people to use less water and provides the City with the ability during water shortage to shut off irrigation without affecting potable water supply

Southern California Gas Company (SoCalGas) partnership with CPUC

Work with CPUC is ongoing to explore and address risks to natural gas infrastructure from stronger storms and landslides.

Beverly Hills water emergency ordinance

Ordinance established stricter rules and enforcement on water use during drought conditions.

Beverly Hill’s Urban Water Master Plan Update - 2013

The City’s Urban Water Master Plan (UWMP) and related capital improvement programs assess water supply and demand and includes programs to monitor the City’s water reservoirs and drought conditions.

Asset managers identified issues with current programming and barriers to further increasing resilience. These issues and barriers are listed below.

- Stormwater systems in Beverly Hills are older and need to be updated.
- Water per capita remains significantly higher when compared to other cities, despite having met the MWD goal to reduce water use by 20%.
- Brush clearing can create a landslide risk in some areas. The City is prioritizing wildfire mitigation over landslide mitigation.

Wildfire

Table 8 lists programs, plans, and policies that help increase the community’s resilience to wildfire impacts.

**Table 8 Programs, Plans, and Policies to Manage Wildfire Impacts**

<table>
<thead>
<tr>
<th>Existing and Planned Programs, Plans, and Policies</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly Hills Wildfire Assessment Report - 2021</td>
<td>This Report address the collective actions taken by the City of Beverly Hills to address their wildfire vulnerabilities. It provides a comprehensive overview to identify gaps from these efforts, while building consensus and initiating actions on how to move forward based on the most appropriate and effective steps possible. The focused goal is to help the City of Beverly Hills, and its citizens, be better prepared when – not if – a wildfire threatens this community. The report includes a GIS tool called FlameMapper, which is dedicated to understanding wildfire behavior, prediction, and structure vulnerabilities. Maps created with FlameMapper will help identify more precisely where the highest risks exist, and how the City may choose to prioritize their efforts. It also looks at potential vulnerabilities of Beverly Hills. The Wildfire Assessment Report examines key topics related to fire safety including public trees, private landscaping, education, evacuation challenges, smoke impacts and structure resiliency.</td>
</tr>
</tbody>
</table>
### Existing and Planned Programs, Plans, and Policies

<table>
<thead>
<tr>
<th>Programs, Plans, and Policies</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverly Hills Building and Fire Code Updates</td>
<td>Regular updates to the City’s building and fire codes occur every three years, or when the State updates the California building and fire codes, to reflect the highest and best available standards for wildfire resistant design and performance of buildings and to conform to State requirements.</td>
</tr>
<tr>
<td>Beverly Hills Evacuation Routes – 2013</td>
<td>A plan adopted in 2013 that established Citywide evacuation routes during a disaster and strategies to educate the public about emergency access.</td>
</tr>
<tr>
<td>Beverly Hills Fire Department Access – 9-2-2 Amendments to the Fire Code</td>
<td>The City’s code establishes standards for private and public access drives and roadways to preserve and maintain Fire Department access to properties.</td>
</tr>
<tr>
<td>Beverly Hills Firewise Community Board</td>
<td>The Firewise Community Board evaluates and implements recommendations made by the Firewise Communities Program.</td>
</tr>
<tr>
<td>Beverly Hills Firewise/Waterwise Mitigation Demonstration Garden – 2013</td>
<td>A demonstration garden that educates the community on what type of plants are both Firewise and Waterwise.</td>
</tr>
<tr>
<td>Beverly Hills full-time Fire Inspector for Evacuation Routes</td>
<td>The City employs a full-time inspector that helps to mitigate risk associated with wildfire and protecting evacuation routes.⁹⁰</td>
</tr>
<tr>
<td>Beverly Hills New Development Impacts - 2015</td>
<td>The City reviewed and revised the Zoning Code to limit uses and establish development standards for developments in landslide areas.</td>
</tr>
<tr>
<td>Beverly Hills Updated City Code – 2014</td>
<td>City codes were updated to reflect recommendations set forth by the Firewise assessment and Joint Wildland Interface Task Force.</td>
</tr>
<tr>
<td>Beverly Hills Vegetation Management Public Education</td>
<td>Beverly Hills distributes public education materials to residents regarding vegetation management around their homes.</td>
</tr>
<tr>
<td>Beverly Hills Wood Roof Public Education</td>
<td>Beverly Hills actively educates residents on the potential fire hazard regarding wood roofs.</td>
</tr>
</tbody>
</table>

Asset managers identified issues with current programming and barriers to further increasing resilience. These issues and barriers are listed below.

- Though power lines in the Very High Fire Hazard Severity Zone have been moved underground, there may be some lines South of Sunset Boulevard that are on private property and may be more difficult to underground. Accessing funding to implement wildfire mitigation strategies can be a challenge.

### Multiple Climate Hazards

Table 9 lists programs, plans, and policies that help increase the community’s resilience to multiple climate hazards.

#### Table 9 Programs, Plans, and Policies to Manage Multiple Climate Hazard Impacts

<table>
<thead>
<tr>
<th>Programs, Plans, and Policies</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Beverly Hills Local Hazard Mitigation Action Plan 2017-2022</td>
<td>Provides a list of activities that may assist the City in reducing risk and preventing loss from future events. It also includes information that can assist City Departments, residents, public and private sector organizations, and others in participating in planning for disasters. It promotes public policy and</td>
</tr>
</tbody>
</table>

⁹⁰ Descalzo, Josette (Environmental Compliance and Sustainability Programs Manager), et al. July 21 and July 28, 2021. Asset Manager Interviews.
### Existing and Planned Programs, Plans, and Policies

<table>
<thead>
<tr>
<th>Program Description</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Beverly Hills General Plan 2021-2029 Housing Element Update (Draft)</td>
<td>The Housing Element establishes a strategy to facilitate the provision of an adequate supply of safe, affordable housing for all community members, regardless of income, and inclusive of those with special housing needs. There are several goals and policies that will support the community’s capacity to better withstand the impacts associated with climate change, including policies that seek to improve housing affordability, provide services to the unhoused, upgrade existing housing stock, and promote green building practices. There are also policies to take action in combating patterns of segregation and fostering inclusive communities.</td>
</tr>
<tr>
<td>Urban Forest Management Plan for the City of Beverly Hill (2022)</td>
<td>The Urban Forest Management Plan focuses on creating a climate resilient Beverly Hills through tree canopy. The plan includes analysis of climate-related threats to the urban forest including drought and extreme heat, excessive flooding, and pests and pathogens. The plan also includes goals, strategies, and objectives to increase resilience of the urban forest.</td>
</tr>
<tr>
<td>Community Emergency Response Team (CERT) Program</td>
<td>Offered to residents of Beverly Hills to improve emergency preparedness. Beverly Hills is looking at ways to make this program more cost effective</td>
</tr>
<tr>
<td>Block by Block Program</td>
<td>Program to provide safety and hospitality ambassador services to the City.</td>
</tr>
<tr>
<td>Commissioner Emergency Training</td>
<td>Program to conduct disaster preparedness for all City Commissioners in order to have commissioners prepared to assist City during a hazard event.</td>
</tr>
<tr>
<td>Emergency Management Exercises</td>
<td>Program to conduct periodic emergency management exercises with City personnel and surrounding jurisdictions.</td>
</tr>
<tr>
<td>Hazardous Materials Awareness</td>
<td>Program to conduct outreach to all City residents on how to properly store and secure hazardous materials to avoid spillage and breakage during a hazard event.</td>
</tr>
<tr>
<td>Inter-jurisdictional Coordination</td>
<td>The City continues to coordinate with and support the Los Angeles County Certified Unified Program Agency (CUPA), the Los Angeles County Fire Department, and their Health &amp; Hazardous Materials Division (HHMD) in carrying out inspections, emergency response, enforcement, and site mitigation oversight of hazardous materials and waste.</td>
</tr>
<tr>
<td>Joint Effort in Emergency Disaster Management</td>
<td>Program to ensure that emergency disaster management is the mutual responsibility of all City Departments and a variety of stakeholders, including the Citizen Corp Program, Beverly Hills Unified School District private schools, local residents, and the business community</td>
</tr>
<tr>
<td>Medical Facility Identification</td>
<td>Program to identify all possible medical facilities in the City that are capable of providing medical services, such as triage, during a large hazard event.</td>
</tr>
</tbody>
</table>

Table 10 lists the mitigation strategies identified in the City’s LHMP. These strategies, if implemented, improve the community’s resilience to climate change hazards. Existing adaptation-related strategies from the LHMP will be referenced in the Climate Action and Adaptation Plan and new policies and actions will be developed, as necessary, based on gaps identified in this Vulnerability Assessment.
### Table 10 Climate Change-related Mitigation Strategies from the Local Hazard Mitigation Plan

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td><strong>Stormwater Physical Protection.</strong> Design and construct a flood barrier around the Police Station, Library, and parking structure to prevent water from entering these areas to provide physical protection against storm water exposure.</td>
</tr>
<tr>
<td>Flood</td>
<td><strong>Improve FERP (Flood Emergency Response Plan).</strong> Add the following components to FERP – A reliable flood warning method, a person who has the authority to activate the plan, a clear list of responsibilities for the key leaders, documented de-energization and shutdown procedures, actions to reduce the damage by using available resources and staff, and a recovery and cleanup plan.</td>
</tr>
<tr>
<td>Multi-Hazard</td>
<td><strong>Disaster Ready.</strong> Give City businesses the tools they need to prepare themselves to be self-sufficient in the event of a disaster. Participating businesses are encouraged to spread the word of this program to their surrounding neighbors. Businesses will be recognized for their efforts.</td>
</tr>
<tr>
<td>Flood</td>
<td><strong>Update Flood Damage Prevention Ordinance.</strong> Update flood construction provisions in Beverly Hills Municipal Code to coordinate with updated FEMA maps for the City.</td>
</tr>
<tr>
<td>Flood</td>
<td><strong>Greystone Reservoir, Reservoir 4A and LADWP water transition pipeline inundation and water pipe maps.</strong> Hire a consultant to develop and update the Greystone Reservoir and Reservoir 4A and develop LADWP maps and inundation maps. Mapping has been updated for Greystone.</td>
</tr>
<tr>
<td>Multi-Hazard</td>
<td><strong>Evacuation Route.</strong> Develop and educate residents on a Citywide evacuation route during a disaster.</td>
</tr>
<tr>
<td>Drought</td>
<td><strong>Water conservation project.</strong> Increase water conservation campaign exposure throughout the City. Implement innovative water saving devices and programs, such as irrigation meters and volumetric wastewater pricing, for residents and businesses.</td>
</tr>
<tr>
<td>Drought</td>
<td><strong>Rehabilitation of Cabrillo Reservoir.</strong> Determine the feasibility of rehabilitating the site for an additional reservoir for firefighting and water storage resilience. The City is currently looking into alternative sites for water storage resiliency.</td>
</tr>
<tr>
<td>Drought</td>
<td><strong>Green Streets and Water Efficient Landscape on Burton Way Median.</strong> The project consists of constructing green street function on the median to collect urban runoff during a storm event to prevent pollutants from entering the storm drain system. The project will also utilize captured urban runoff for site irrigation.</td>
</tr>
<tr>
<td>Drought</td>
<td><strong>La Cienega Park and Frank Fenton Field Stormwater Retention.</strong> The project has a potential to capture 24.0 acre-feet of urban runoff from a large drainage area from the cities of West Hollywood, Los Angeles, and Beverly Hills. The purpose of the project is to collect urban runoff during a storm event to prevent pollutants from entering the storm drain system. The water collected will be discharged to the sewer system and eventually be an additional source for recycled water for the region.</td>
</tr>
<tr>
<td>Drought</td>
<td><strong>Shallow Groundwater Wells. Increase the City’s water supply.</strong> Develop and construct two shallow groundwater wells. The City is looking into two shallow wells at La Cienega Park.</td>
</tr>
<tr>
<td>Multi-Hazard</td>
<td><strong>Building and Fire Code Updates.</strong> Continue to update the City’s building and fire codes once every three years, or whenever the State updates the highest and best available standards for seismic design and performance of buildings and to conform to State requirements. Review and update existing city codes to reflect recommendations set forth by the FireWise assessment and joint Wild land Interface Task Force.</td>
</tr>
<tr>
<td>Fire</td>
<td><strong>Vegetation Management Public Education.</strong> Develop public education materials to the residents regarding vegetation management around their homes.</td>
</tr>
<tr>
<td>Multi-Hazard</td>
<td><strong>Inter-jurisdictional Coordination.</strong> Continue to coordinate with and support the Los Angeles County Certified Unified Program Agency (CUPA), the Los Angeles County Fire Department, and their Health (Hazardous Materials Division) in carrying out inspections, emergency response, enforcement, and site mitigation oversight of hazardous materials and waste.</td>
</tr>
<tr>
<td>Fire</td>
<td><strong>Wood Roof Public Education DVD.</strong> Educate residents on the potential fire hazard regarding wood roofs.</td>
</tr>
<tr>
<td>Utility Failure</td>
<td><strong>Water Storage and Distribution.</strong> Develop a plan for water storage preparation and water distribution during infrastructure failure.</td>
</tr>
</tbody>
</table>
Vulnerability Overview

Vulnerability to climate change is based on the combination of exposure to future climate hazards, the sensitivity of the community and assets to climate hazards, and the capacity of the community and assets to adapt. This section provides a qualitative analysis of vulnerability for community members, infrastructure, disaster preparedness and response, and coordination in Beverly Hills. The City has already implemented infrastructure improvements to increase resilience (e.g., undergrounding utility lines in the Very High Fire Hazard Severity Zones), adopted disaster preparedness and response plans, adopted an Urban Forest Management Plan, and regularly engages with local, regional, and state stakeholders to increase resilience. However, there are significant gaps in policies and programs, particularly related to maintaining the useability of public facilities in the face of more extreme climate risks, accelerating home retrofits to harden against wildfire risk, preparing populations most vulnerable to extreme heat and poor air quality, reducing per capita water use, monitoring the risk of landslides, and more effective tracking and monitoring of resilience efforts. These findings, along with input from Beverly Hills residents and businesses, will be used to inform measure development for inclusion in the Climate Action and Adaptation Plan.

Populations

Overall, Beverly Hills residents have low social vulnerability to the impacts of climate change. This means they should be able to prepare for, respond to, and recover from climate shocks and stressors relatively well compared to other communities in California. However, there are small portions of the population with increased vulnerability due to their socioeconomic status, physical and household characteristics, minority and language status, and housing and transportation characteristics. The City should ensure that low-income households, older adults, people with disabilities, children, and renters are prioritized in resilience-related programs and in education and outreach.

Identify incentive programs and rebates that can reduce the costs associated with home resilience upgrades. Home improvements to improve water and energy efficiency, such as replacing gas-powered appliances and installing solar panels, require an initial investment which can be burdensome to low-income households. The City should incorporate financial support to low-income households in new programs and building requirements.

Consider resilience actions that apply to renters. Data described in the SVI analysis indicate that over half of the population in the City are renters. Renters have less agency to make changes in their dwelling that could increase their resiliency, such as installing double-pane windows to better insulate their homes during extreme heat events. Additionally, households who rent tend to have lower incomes. The City should consider portable interventions (like portable air conditioners, air filters, and batteries) and community facilities where people can take refuge.

Provide education and outreach that specifically address the dangers of heat and wildfire for older adults, people with disabilities and underlying conditions, and children. Extreme heat and bad air quality are more dangerous for people who are physiologically frailer. They are more at risk of experiencing heat illness from the strain on cardiac and pulmonary systems. The City should provide targeted outreach and education about heat illness symptoms and prevention at places that
serve these populations (senior centers, religious institutions, schools, daycares, etc.). The City should consider partnering with public health experts and community-based organizations on preparing and disseminating materials and engaging in targeted outreach.

Infrastructure

As a result of climate change, City facilities and services will become exposed to a greater number of extreme heat events, extreme weather events (flooding), and wildfire (including air quality impacts). Increases in wildfire risk are the predominant vulnerability for the City to address. However, because wildfire risk is linked to other climate change factors, including increased temperatures, drought patterns, and extreme weather, a comprehensive strategy will be needed to address climate change but also protect the public and the essential services from the air quality, weather, and heat hazards it is expected to experience in the coming decades.

The City has numerous existing adaptive capacities, including mitigation strategies from the LHMP and Urban Forest Management Plan, to continue and build from to manage climate change moving forward. It should focus its attention on resilience investments that address multiple forms of climate risks.

Maintain the useability of public facilities as temperatures increase and air quality emergencies become more prevalent. Climate change will drive the need for more energy and water efficient facilities. More robust temperature and air quality control may become necessary to protect the health of facility employees and visitors. These additional requirements will need to be incorporated into future facility retrofits and designs. The City should also conduct a feasibility study to investigate the potential offsite clean energy fueling stations for waste haulers to reduce disruptions during extreme heat events. In addition, setting more aggressive water use reduction goals for residents and encouraging or requiring separate irrigation meters that could be shut off during a water shortage could increase the community’s resilience to drought.

Maintain the integrity of public facilities as extreme weather events become more prevalent. Severe weather will become more extreme because of climate change. Public facilities may be expected to withstand conditions beyond their original design parameters. For example, pavement binders may degrade more quickly or fail because of increased temperatures and stormwater infrastructure may be overwhelmed by more extreme precipitation events. Bus service could be disrupted because of flooded roadways. As a result, it will be necessary for the City to employ design parameters that account for climate change (not just based upon historical averages). Structural changes may also be required to protect facilities from more extreme and dynamic wildfire risk. In addition, the City should consider installing landslide monitoring equipment and exploring landslide defenses, especially in areas where brush has been cleared to reduce wildfire risk. Coordination with transit providers to ensure minimal disruption to bus and train service because of localized flooding, wildfires, or damaged infrastructure from extreme heat will be necessary.

Maintain the ability of the City to provide essential services as extreme weather events become more prevalent. In most cases, the City can incorporate resilience strategies into existing plans and procedures to protect its services against hotter temperatures, more extreme weather, drought, and wildfire. This could include adding hazard mitigation and resilience criteria to its existing Capital Improvement Plans. The City should also consider increased investments in resilient alternatives to traditional infrastructure solutions such as green infrastructure, non-permeable pavements, and
more tree cover. The City should include climate projections in design criteria so that new structures and infrastructure are built for future conditions rather than historical ones.

**Disaster Preparedness and Response**

The City can expect to experience a greater number of disasters because of climate change. Potential types of disasters to prepare for include extreme heat emergencies, air quality emergencies associated with wildfire smoke, wildfire, flooding, and extreme weather. Increases in wildfire risk and extreme heat emergencies will be the predominant vulnerability for the City to address because of its potential severity and increase in probability of occurrence.

The City has significant existing capacity in the form of existing policies, measures, and programs in the form of drought contingency planning, fire protection, and coordination with neighboring jurisdictions (e.g., in the Wildfire Assessment Report which include mitigation strategies). The City has also hired a full-time inspector to help mitigate wildfire risk and protect evacuation routes. The City also has in place several planning documents that outline protocols, procedures, and operations for effective emergency response to a variety of hazards. However, more attention can be provided for heat and air quality emergencies.

**Improve community preparedness for wildfire events.** The City can continue to support public safety by providing clear messaging and guidance for evacuation planning, including how to sign up for the SCE Automated System, prepare structures and community members for the threat of increased wildfires, and how to prepare for potential loss of communication networks during an emergency. Increased membership in the Community Emergency Response Team (CERT) trainings, which can prepare neighborhoods for disaster scenarios, should continue to be encouraged.

**Facilitate advanced planning and mobilization for evacuating vulnerable groups.** Some households and individuals may require special assistance under evacuation orders. The City should continue to work with community-based organizations, hospitals, assisted living residences, other facilities that support people with limited mobility and those who may be socially isolated on evacuation planning. Evacuation procedures for all vulnerable residents (not just those currently participating in the Emergency Evacuation Assistance Registry Program) should be revised, reviewed, and retrained on a regular basis.

**Improve preparedness for extreme heat emergencies.** The probability of an extreme heat event that impacts the City is expected to increase because of climate change. The City should develop a response plan for heat emergencies and put in place contingencies should one occur. This plan should consider extreme heat events in conjunction with potential pandemic impacts or other compounding scenarios, such as poor air quality.

**Coordination**

The City already engages in a significant amount of coordination with local, regional, and state stakeholder. Given resource constraints, improved resilience for the City and its residents will require continued coordination with existing stakeholders in a focused and efficient way.

**Regularly monitor and evaluate the implementation of resilience strategies.** Given the anticipated influence of climate change on the City’s hazard risk, it will be important for the City to remain organized, understand what is working and where to prioritize resources. More effective activity tracking will enable the City to allocate resources, demonstrate progress, and be more accountable.
to its citizens. One option would be to create a new City staff position and integrate the implementation of the Climate Action and Adaptation Plan into the workplan for existing City commissions.

**Collaborate with utility providers to secure resources that improve community resilience.** Collaborate with utility providers like SCE to secure outside funding for resilience efforts. For example, SCE provides grant funding opportunities for public safety and emergency preparedness that focus on programs addressing wildfire risk, emergency preparedness, and electrical safety. The City should continue to focus on assessing resilience of critical facilities, such as the water treatment plant, and build in redundancies, like renewable energy sources.

**Conclusion**

This Climate Change Vulnerability Assessment identifies the community members, transportation assets and critical infrastructure assets most at risk to climate change hazards. Although climate change is one of the more pressing challenges Beverly Hills faces, it presents an opportunity to address multiple community goals, including improving the local economy, public health, quality of life, and the delivery of essential services. Specific actions the City of Beverly Hills will take to better prepare for the effects of climate change are provided in the Climate Action and Adaptation Plan.