CITY OF GLENDALE

SAFETY ELEMENT

Insert Date Adopted

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Chapter 1 Introduction

1.1 Legal Requirements

The City of Glendale has updated the Safety Element of its General Plan in conformance with State law. As required by Section 65302(g) of the California Government Code, every local government is required to maintain a comprehensive Safety Element that addresses a variety of natural and man-made hazards and that provides goals and policies aimed at reducing the risk associated with these hazards.

The Safety and Seismic Safety Elements first became mandatory parts of the General Plan in 1975, when the California Legislature adopted Senate Bill 271 (Chapter 1104). This legislation required cities and counties to adopt General Plan policies relating to, at a minimum, fire safety, flooding, and geologic hazards. The City of Glendale responded to this legislation by adopting its first Safety and Seismic Safety Elements in 1976. In 1984, the Legislature adopted Assembly Bill 2038 (Chapter 1009) that expanded the list of mandatory issues that were to be evaluated in the Safety Element, with emphasis on seismic issues, and combined the previously separate Safety and Seismic Safety Elements into a single document. In 2015, the legislature adopted Senate Bill 379 requiring Safety Elements to incorporate climate adaptation and resilience strategies. New requirements to consider evacuation and emergency access were adopted pursuant to Assembly Bill 747 and Senate Bill 99 in 2019 and Assembly Bill 1409 in 2021.

The 2018 Local Hazard Mitigation Plan (LHMP) for the City of Glendale planning area was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA's Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard risk. The implementation of these mitigation actions, which include both short and long-term strategies, involve planning, policy changes, programs, projects, and other activities.

1.2 Purpose and Content

Originally adopted in 1976, amended in 2003, and updated in 2025, the Safety Element focuses on fire, earthquakes, flooding, and other geologic hazards, but it also addresses other safety-related issues, as required by State law. **The ultimate objective of the Safety Element is to improve the safety of the City of Glendale, through the protection of areas with hazards and resource constraints; safeguarding services and existing infrastructure, and in the process make the City more resilient and prosperous.**

The Safety Element serves the following functions:

- Provides an assessment of the natural and man-made hazards in the City, including, but not limited to, earthquakes, landslides, fire, flood, dam inundation, hazardous materials incidents, terrorism, and vector control, and considers the impacts of climate hazards including extreme heat, extended drought, and worsening air quality. A more in-depth analysis of each of these hazards is provided in the Technical Background Report (Appendix A) and the Climate Change Vulnerability Assessment (CCVA) (Appendix B). Important terms and concepts related to each of these topic areas are marked with **bold** text and defined throughout the Safety Element document.
- Provides a framework by which safety considerations are introduced into the land use planning process and the redevelopment process.
- Strengthens the City's existing municipal codes and provides guidelines that the City can use during the project review and permitting process to identify and mitigate hazards for new development and redevelopment. Future development and redevelopment should always consider the incorporation of measures aimed at reducing these hazards to acceptable levels.
- Provides policies directed at identifying and reducing hazards in existing development; and
- Strengthens earthquake, flood, fire, and hazardous materials preparedness planning and provides post-disaster reconstruction policies specific to the City of Glendale.
- Incorporates findings from the Climate Change Vulnerability Assessment to assess the impacts of climate risks specific to the City. The Climate Change Vulnerability Assessment evaluates how climate change may impact community members and physical assets including natural and recreational resources, buildings and facilities, and infrastructure and critical services in Glendale and informs the development of resilience goals, policies, and programs.

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To that end, the Safety Element describes the natural conditions that pose a hazard, but most importantly, it presents goals, policies, and programs that if implemented can substantially reduce the risk these hazards pose to the City of Glendale and its residents. Each of these terms and components of the Element is explained further below:

- **Risk** is defined as the outcome of the interaction between a hazard and the elements of the community, such as population, buildings, and infrastructure that are vulnerable to such an impact. [In simpler terms, **Risk = Hazard x Vulnerability**.]
- **Goals** are statements that describe the City's purpose and direction in reducing its natural hazards. They are the desired condition that the City would like to achieve.
- **Policies** are guidelines that can be implemented to reduce the City's risk and maximize the community's emergency preparedness. These are statements that address specific concerns of long-term planning importance to the community.
- **Programs** are the specific actions that the City has committed to implement over a given number of years to reduce its hazards. They are specific implementation measures selected to maintain or improve public safety, and to satisfy the objectives of the policies and goals. Where appropriate, the agency or City department responsible for implementation and monitoring of each of these programs is identified.

Whether related to natural or man-made hazards or disaster preparedness, the Safety Element goals are guided by the City's desire and responsibility to:

- Minimize fatalities and injuries;
- Minimize the burden on public and emergency response resources (police, fire, medical, etc.);
- Minimize public and private costs for cleanup, repair, and recovery; and
- Minimize long-term impacts caused by displaced households, business disruption, and reduced fiscal resources (with a consequent tax burden).

Specific hazards of concern to Glendale include earthquakes, landslides and mudflows, dam or reservoir failure, wildland and structural fire, storm flooding, contamination of soil and groundwater resources by hazardous materials, terrorism, civil unrest, crime, and climate change hazards. These hazards can impact the entire City, and in particular, vulnerable populations, physical and natural assets, and critical facilities, ,. **Critical facilities** provide essential services to the public, are otherwise necessary to preserve the welfare and quality of life in the City, or fulfill important public safety, emergency response, and/or disaster recovery functions. The City's critical facilities have been identified in the Glendale CCVA. Each of these hazards, and others of lesser impact, are described further in the following pages; for a more detailed description of each of these conditions, refer to the accompanying Technical Background Report (Appendix A) and the CCVA (Appendix B).

1.3 Limitations

Safety Elements are by scope and definition, provisional. Although the ultimate goal of these documents does not change much over time, the information, tools and techniques available to assess the community's risk to various types of hazards are continuously evolving. Policies and programs are established within a framework that identifies timelines and priorities. As more critical goals are achieved, emphasis is shifted to new priorities. Most of the data, relationships and processes that affect a community are spatial in nature, and multi-variant. As a result, GIS-based mapping is utilized to describe the relationship of the hazards to the assets in Glendale. By using relevant data on the existing built environment, this report illustrates the potential risks to the community and the infrastructure of the City.

The Safety Element provides a general evaluation of potential hazards on a City-wide basis. The identification and assessment of the hazards described in this document are based on literature and sources available at the time that this Element was prepared. Site-specific studies were not conducted specifically for this study. For effective emergency preparedness and response, communities need to know in advance what are the potentially hazardous conditions specific to their area. A major part of this effort requires mapping of the vulnerable areas in the community. This is covered in the **Technical Background Report** (Appendix A) to the Safety Element. For example, the Technical Report identifies the fault zones that cross the City, areas of

potential landslides and unstable slopes, areas susceptible to fire and flooding hazards, and areas where most hazardous materials in the City are being used, stored, or generated. However, the hazard maps that serve as the basis for the Technical Background Report (Appendix A) are by necessity generalized; the boundaries between hazard zones should not be interpreted as precisely defined. In addition, the **Climate Change Vulnerability Assessment (CCVA)** (Appendix B) includes maps and infographics that highlight climate hazards including extreme heat, drought, wildfire, landslides, stormwater flooding and extreme precipitation, poor air quality, and social vulnerability. This document and the accompanying illustrations are to be used for general land use planning purposes only, such as in land use decisions. This Element should not be used for site-specific studies, but rather, it should be used to identify areas where detailed site-investigations should be required for new developments or for redevelopments.

Computer simulations that estimate loss of life and damage to buildings and infrastructure (such as HAZUS, the software used for this study) help to design and prioritize appropriate mitigation plans. The results of these models, however, are estimates only, and this should not be forgotten. It is the magnitude, rather than the specific value, of the results that is significant (an earthquake that results in about 4,000 casualties is clearly more severe an event than one that causes about 150 casualties). Once this information is known, appropriate measures can be taken to reduce the hazard and to prepare for and respond to the estimated level of damage. These are the topics covered in this Element.

It is acknowledged that sometimes policies and programs designed to reduce specific hazards may come in conflict with individuals' rights in their properties. Whenever possible, the mitigation measures included herein will be conducted without violating the property owners' rights to modify or improve their investments, along with preserving the aesthetic or natural conditions of the area through minimal modifications. However, when these goals are in conflict, protection of life and property should and will take precedence.

Chapter 2 Regulatory Environment

There are several Federal and State programs and regulations pertaining to public safety that provide the legal framework to Safety Elements of the General Plan. These programs provide the minimum guidelines and criteria that must be complied with – individual jurisdictions can choose to go beyond the Federal or State requirements and implement more stringent regulations. Some of the specific plans and programs that apply to the City of Glendale are discussed briefly below. This is not intended to be an all-inclusive list. For a more detailed description of the programs described below, refer to the Technical Background Report (Appendix A). For information regarding additional Federal, State and City regulations, refer to the Federal and State Codes of Regulations, and the City of Glendale Municipal Codes.

2.1 California Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was signed into law in 1972 and amended in 2023 in Assembly Bill 1046. Its primary purpose is to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault. The Act requires the State Geologist to delineate "**Earthquake Fault Zones**" along faults that are "sufficiently active" and "well defined." The Act dictates that cities and counties withhold development permits for projects within an Earthquake Fault Zone within their jurisdiction until geologic investigations demonstrate that the projects are not threatened by surface displacements from future faulting. Projects include all land divisions and most structures for human occupancy. State law exempts single-family wood-frame and steel-frame dwellings that are less than three stories and are not part of a development of four units or more. However, local agencies can be more restrictive than the State.

2.2 California Seismic Hazards Mapping Act

The goal of the Seismic Hazards Mapping Act of 1990 is to minimize loss of life and property by identifying and mitigating seismic hazards. The act addresses non-surface fault rupture earthquake hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The State agency charged with implementation of the Act is the California Geological Survey (CGS). The CGS prepares and provides local governments with seismic hazard zone maps that identify areas susceptible to amplified shaking, liquefaction, earthquake-induced landslides, and other ground failures. The seismic hazard zones delineated by the CGS are referred to as "zones of required investigation," because site-specific geological hazard investigations are required for construction projects located within these areas.

2.3 Real Estate Disclosure Requirements

Pursuant to the Natural Hazards Disclosure Act, since June 1, 1998, sellers of real property and their agents are required to provide prospective buyers with a "Natural Hazard Disclosure Statement" when the property being sold lies within one or more State-mapped hazard areas, such as within an Alquist-Priolo Earthquake Fault Zone or a Seismic Hazard Zone.

2.4 California Environmental Quality Act

The California Environmental Quality Act (CEQA) was passed in 1970 to ensure that local governmental agencies consider and review the environmental impacts of development projects within their jurisdictions. CEQA requires that an Environmental Impact Report (EIR) be prepared for projects that may have significant effects on the environment. EIRs are required to identify geologic and seismic hazards, and to recommend potential mitigation measures, giving the local agency the authority to regulate private development projects in the early stages of planning. Wildfire risk is also considered in EIRs with an analysis of impacts on urban development.

2.5 California Building Code

Title 24 Building Standards Code, as adopted by the Division of the State Architect, includes the California Building Code (CBC), which provides "minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures and certain equipment." These documents are historically updated every three years. The most recent version of the CBC was published in 2022, based on

the International Building Code (IBC). The City of Glendale has adopted the 2022 CBC edition with local amendments.

2.6 Unreinforced Masonry Law

The Unreinforced Masonry Law of 1986 requires all cities and counties in Seismic Zone 4 (CBC, 1998) to identify hazardous unreinforced masonry (URM) buildings in their jurisdictions. Seismic hazard zones are regulatory zones established by the Department of Conservation and the California Geological Survey that encompasses areas that may be at higher risk during earthquakes due to weak soil or rock beneath the area or property.[1] Much of the western and eastern portions of the city, near mountainous terrain, are located in seismic hazard zones and are at risk to liquefaction and landslide.[2] Thus, owners of such buildings must be notified of the potential earthquake hazard, and mitigation must be performed. The mitigation method, which may include retrofitting or demolition, is left to the local jurisdiction. URMs in Glendale have been identified and catalogued in accordance with Chapter 58 of the Glendale Building Code. As of 2024, of the 703 URM buildings identified in the City, only 2 had not yet been retrofitted or demolished.

2.7 National Flood Insurance Act and Flood Disaster Protection Act

The Federal Emergency Management Agency (FEMA) is mandated by the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 to evaluate flood hazards and provide Flood Insurance Rate Maps (FIRM's) for local and regional planners to promote sound land use and floodplain development. Further, the Flood Disaster Protection Act requires owners of all structures in identified Special Flood Hazard Areas to purchase and maintain flood insurance as a condition of receiving Federal or federally related financial assistance, such as mortgage loans from federally insured lending institutions. The National Flood Insurance Reform Act of 1994 further strengthened the National Flood Insurance Program (NFIP) by providing a grant program for State and community flood mitigation projects. The act also established a system (Community Rating System - CRS) for crediting communities that implement measures to protect the natural and beneficial functions of their floodplains, as well as managing the erosion hazard. The City of Glendale has participated in the NFIP since 1984 (City ID No. – 065030). The latest FIRM maps for the City were created in 2008, and Glendale has been identified as an eligible and future participating community in FEMA's list of CRS cities.[3]

2.8 Fire Regulations and Emergency Evacuation

Assembly Bill 337 (the Bates Bill, adopted September 29, 1992) was passed as a direct result of the great loss of lives and homes in the Oakland Hills "Tunnel Fire" of 1991. The Bates Bill Process is used to identify Very High Fire Hazard Severity Zones (VHFHSZs). Under **Assembly Bill 3819**, passed in 1994 (AB 3819 – Willie Brown), "Class A" roofing, minimum clearances of 30 feet around structures, and other fire defense improvements are required in VHFHSZs.

Assembly Bill 6 (AB6) requires that fire hazard areas be disclosed in real estate transactions. **Civil Code Section 1103(c)(6)** also requires real estate sellers to inform prospective buyers whether or not a property is located within a wildland area that could contain substantial fire risks and hazards.

Public Resources Code Section 4290 requires minimum statewide fire safety standards pertaining to:

- Road standards for fire equipment access;
- Standards for signs identifying streets, roads, and buildings;
- Minimum private water supply reserves for emergency fire use; and
- Fuel breaks and greenbelts.

[1] California Department of Conservation (CDC). 2024. California Seismic Hazard Zones. https://www.conservation.ca.gov/cgs/sh/seismic-hazard-zones#:~:text=Hazard%20Zone%E2%80%8B%3F-,%E2%80%8B,fail%20during%20strong%20ground%20shaking. (accessed October 2024)

[2] California Department of Conservation (CDC). 2024. EQ Zapp: California Earthquake Hazard Zones Application. https://www.conservation.ca.gov/cgs/geohazards/eq-zapp (accessed October 2024)

[3] Federal Emergency Management Agency (FEMA). 2024. Community Rating System. https://www.fema.gov/floodplain-management/community-rating-system#participating.

Wildland fire areas are also subject to **Public Resources Code Sections 4291 through 4299**, which require property owners in such areas to conduct maintenance in order to reduce the fire danger. The City of Glendale uses the California Fire Code with amendments and several other fire ordinances to further reduce the City's vulnerability to structural and wildland fires.

Assembly Bill 3065 (passed in 2004) requires that the draft Safety Element be submitted to the State Board of Forestry and Fire Protection (CAL FIRE) and local agencies that provide fire protection at least 90 days prior to the local adoption of the Safety Element.

Senate Bill 1241 (passed in 2014) requires the Safety Element to be reviewed and updated to address the risk of fire for land classified as state responsibility areas. The review must consider the suggestions from the Office of Land Use and Climate Innovation (LCI) most recent publication of "Fire Hazard Planning, General Plan Technical Advice Series." Policies and implementation programs in alignment with the Attorney General's wildfire mitigation measures must be included in the Safety Element update.

Senate Bill 1035 (passed in 2018) requires the Safety Element to be reviewed at minimum once every eight years and revised as necessary to identify new information relating to flood and fire hazards and climate adaptation and resiliency strategies applicable to the city or county that was not available during the previous revision of the Safety Element.

Assembly Bill 747 (passed in 2019) and requires the Safety Element to address evacuation routes related to identified fire and geologic hazards. As of 2020, **Senate Bill 99** requires that the Safety Element will be updated to identify residential developments in any hazard area that do not have at least two emergency evacuation routes. Additionally, **Government Code 65302(g)(5)** states that the Safety Element be reviewed and updated with the next revision of the Housing Element to identify residential developments in any hazard area that do not have at least two emergency evacuation routes. **Government Code 65302.15(a)** also requires local governments to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios in their Safety Elements. To support these evacuation bills, LCI established the Evacuation Planning Technical Advisory (TA) to guide cities and counties as they update their general plan Safety Element in accordance with evacuation requirements.

2.9 Standardized Emergency Management System Law

The Standardized Emergency Management System (SEMS) is described by the **Petris Bill (SB 1841)** and is contained in **Chapter 1 of Division 2 of Title 19 of the California Code of Regulations**. It requires all jurisdictions within the State of California to participate in the establishment of a standardized statewide emergency management system. The **California Emergency Services Act, section 8568**, states that "the State Emergency Plan shall be in effect in each political subdivision of the State, and the governing body of each political subdivision shall take such action as may be necessary to carry out the provision thereof." The act provides the basic authorities for conducting emergency operations following the proclamations of emergencies by the Governor or appropriate local authority, such as a City Manager. The City of Glendale has a comprehensive Emergency Plan in accordance with SEMS.

2.10 Emergency Planning and Community Right-To-Know Act (EPCRA)

The primary purpose of the Federal Emergency Planning and Community Right-To-Know Act (EPCRA) is to inform communities and citizens of chemical hazards in their areas. Sections 311 and 312 of the EPCRA require businesses to report to state and local agencies the locations and quantities of chemicals stored on-site. Section 313 of the EPCRA requires manufacturers to report the release to the environment of any of more than 600 designated toxic chemicals. These reports help communities prepare to respond to chemical spills and similar emergencies. In the City of Glendale, businesses that use, store or generate any amount of hazardous materials are required to provide the Fire department with an inventory of the hazardous materials that they use. This helps the Fire Department identify the appropriate actions to take in the event of a significant or threatened significant release of a hazardous material.

EPCRA mandates that Toxic Release Inventory (TRI) reports be made public. The TRI is a database that contains information on toxic chemical releases and other waste management activities reported annually by certain industry groups as well as federal facilities. This inventory was established in 1986 under the EPCRA and expanded by the **Pollution Prevention Act of 1990**.

2.11 Hazardous Materials Disclosure Program

As indicated previously, hazardous materials are extensively legislated by the Federal, State and City governments. The City of Glendale requires all businesses that handle any amount of hazardous materials to submit an inventory of the hazardous materials that they manage to the Glendale Fire Department. This exceeds Federal and State requirements.

In 1986, Congress passed the **Superfund Amendments and Reauthorization Act** (SARA). Title III of this legislation requires that each community establish a Local Emergency Planning Committee (LEPC). This committee is responsible for developing an emergency plan that outlines steps to prepare for and respond to chemical emergencies in that community.

Several California statutes require the emergency notification of a hazardous chemical release. These include: **Health and Safety Codes §25270.7, §25270.8 and §25507; Vehicle Code §23112.5; Public Utilities Code §7673; Government Codes §51018, §8670.25.5(a); Water Codes §13271 and §13272; and California Labor Code §6409.1(b)10. The Safe Drinking Water and Toxic Enforcement Act of 1986, better known as Proposition 65, and §9030 of the California Labor Code** also has specific reporting requirements.

The Environmental Management Center (EMC) is a facility run by the Glendale Fire Department's Hazardous Materials Section that is tasked with administering a household hazardous waste collection plan for the City of Glendale in accordance with the **California Integrated Solid Waste Management Act of 1989 (AB 939)**. The EMC is located at 780 Flower Street. Established in 1986, this section provides a centralized program for regulating and controlling the use and disposal of hazardous substances in the City. The program added a broad range of activities, including regulating underground storage of hazardous materials, disclosure of inventories of hazardous materials in businesses, planning for hazardous material emergencies, and enforcement of regulations to related hazardous material management.

2.12 Climate Change

Recent amendments to **CA Government Code, section 65302(g)(4)** require municipalities to address climate change adaptation and resilience strategies within the Safety Element, essentially requiring cities to actively plan for an address the impacts of climate change within their jurisdictions.

Government Code section 65302(g)(4)(A) requires a vulnerability assessment that identifies climate change risks. This requirement is met by the Local Hazard Mitigation Plan (LHMP) Risk Assessment, which evaluates climate impacts including wildfire, flooding, extreme heat, and sea level rise. Data for these calculations is taken from Cal-Adapt tool and other local data sources, as required by Government Code section 65302(g)(4)(A)(ii). Future updates to the LHMP will continue to expand on this knowledge, bringing in additional information from the Cal-Adapt tool and California Adaptation Planning guide. In addition, there are several other documents that detail vulnerability in Glendale, including the **Climate Action and Adaptation Plan**. This document serves as additional local data sources in keeping with California Government Code section 65302(g)(4)(A)(ii)(III) and (IV).

Government Code section 65302(g)(4)(B) directs cities to create a set of adaptation goals, policies, and objectives to adapt to the impacts of climate change. This requirement is met by the inclusion of Chapter 3, Goals S-3, S-4, and S-5, which detail the goals and policies related to flooding hazards, fire hazards, and climate change.

Government Code section 65302(g)(4)(C) requires municipalities to create a set of feasible implementation measures designed to carry out the goals, policies and objectives that relate to climate change. This Element has been updated to include a section on implementation programs, most of which were developed through related planning efforts. The program list in Chapter 4 details the City's approach to building on the existing mitigation measures discussed above to better address climate change.

Chapter 3 Goals, Policies and Programs

3.1 Seismic and Geologic Hazards

3.1.1 OVERVIEW

A break or fracture between blocks of rock is called a **fault**. Sudden, differential movement on a fault causes an **earthquake**. The strain energy released during an earthquake makes the earth vibrate and shake. Scientists typically use **moment magnitude** to measure the size of an earthquake, which is based on the amount of energy released and is directly proportional to the area of the fault that ruptured. Earthquake damage is typically measured relative to an **intensity** scale. The Modified Mercalli Intensity Scale describes the observable effects that an earthquake has on structures and people.

The State of California considers a fault **active**, and therefore capable of generating earthquakes in the future, if it has moved at least once in the last about 11,000 years. Some faults generate an earthquake every few tens to hundreds of years, while others only break once in thousands of years. Faults with shorter **recurrence intervals** (time between earthquakes) have higher **slip rates** and are generally considered to pose a greater seismic hazard. In Southern California, the San Andreas and San Jacinto faults have the highest recurrence intervals and are therefore considered to have a higher probability of causing an earthquake in the future. The seismic risk posed by a fault is also dependent on when a fault broke last – a fault with a recurrence interval of five thousand years that has not caused an earthquake in as many years may be near the end of its strain accumulation cycle, and may therefore have a higher probability of rupturing than a fault that just caused an earthquake. If a fault breaks to the ground surface, **primary ground rupture** occurs. This typically results in a relatively small percentage of the total damage in an earthquake, but structures sitting directly on top of the ruptured fault can be damaged extensively.

Earthquake-induced strong ground shaking causes most of the earthquake damage. Damage to structures is usually caused by strong **horizontal ground acceleration,** which is measured as a percentage of **g**, the acceleration of gravity.

The degree of shaking depends on several factors, including earthquake size; location; depth of the focus; orientation and movement of the seismic waves (**source effects**); the type of sediments or rocks that the seismic waves travel through (**path effects**); and the interaction between the structures and the sediments or rocks at a specific site (**site effects**). Strong ground shaking can also trigger the destructive secondary effects of liquefaction and slope failure (landslides). **Liquefaction** occurs in soft, saturated sediments – when the ground shakes, the water that fills the pores increases in pressure, causing the soil to lose strength and behave as a liquid.

Most of the loss of life and injuries that occur during an earthquake are related to the collapse of buildings and structures, or people being struck by falling objects within buildings. Several types of buildings are known to perform poorly in earthquakes and are therefore considered hazardous. FEMA (1985) defines a hazardous building as “any inadequately earthquake resistant building, located in a seismically active area, that presents a potential for life loss or serious injury when a damaging earthquake occurs.” Some potentially hazardous buildings include unreinforced masonry (URM), soft-stories (tuck-under-parking), tilt-ups, pre-1960 wood frame buildings that are not tied to their foundation or with URM chimneys, and pre-cast concrete buildings.

Slope failure does not need to be triggered by an earthquake. Some of the most significant factors that contribute to slope failure include slope height and steepness, shear strength and orientation of weak layers in the underlying geologic units, and pore water pressures. Man-made modifications to a slope and stream erosion and down-cutting can also cause a slope to become unstable and fail. Intense precipitation events, or long periods of sustained rainfall, can saturate the soils even on a gentle slope, with the potential for the soils, and the underlying slope, to become unstable. If, in response to gravity, the saturated soils move down slope, they can form **mudflows** or **debris flows**. Mudflows can cause extensive damage to structures in their path. Damaging debris flows also often occur on slopes that were burnt recently because there are few roots holding down the soil and the surface is covered with ash and other debris.

Although not sudden and catastrophic, there are other potential geological hazards that if not recognized and mitigated properly, can cause extensive damage to structures. These hazards are specific to the soils that act as a foundation to buildings and infrastructure and include **collapsible** and **expansive soils**. Collapsible soils undergo a rearrangement of their grains, and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. Expansive soils are fine-grained soils with variable amounts of clay

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minerals that can undergo significant volumetric changes as a result of changes in moisture content. The upward pressures induced by the swelling can have significant harmful effects upon structures and other surface improvements.

Radon gas is a colorless, odorless radioactive gas that forms when naturally occurring radon in the bedrock or soils breaks down. Radon gas can pose a long-term health hazard if it is allowed to collect at high concentrations in structures where people can be exposed to it for long periods of time. There are no immediate symptoms associated with radon gas exposure, but people exposed to elevated concentrations of radon gas over long periods of time can have a higher probability of developing lung cancer. It is estimated that between approximately 7,000 and 30,000 people in the United States die every year due to lung cancer as a result to exposure to radon gas.

3.1.2 LOCAL CONDITIONS

The City of Glendale is located at the boundary between two of Southern California's geomorphic provinces, in an area that is being compressed by geological forces associated with movement on the Pacific and North American tectonic plates. Growth of the San Gabriel Mountains in response to earthquakes on the Sierra Madre fault is the most obvious result of this compression. Other manifestations of this plate boundary include a broad zone of faulting that extends from offshore Southern California inland to the Mojave Desert, and the regular occurrence of earthquakes. Movement of these plates is also causing this portion of Los Angeles basin to rotate clockwise. To accommodate this rotation, several of the faults in the area move laterally, typically with one block moving to the left relative to the other (left-lateral strike-slip).

In the Glendale area, the main faults include the Sierra Madre, the Verdugo and the Raymond faults (see Plate P-1. The Sierra Madre fault is a reverse fault that extends across the northern portion of the City, at the base of the San Gabriel Mountains. A portion of the Sierra Madre fault extending through Glendale is zoned under the Alquist-Priolo Earthquake Fault Zoning Act, so geological evaluations to locate the fault are mandated by State law if developments or re-developments amounting to more than 50 percent of the value of the structure are proposed within this zone.

The Verdugo fault, which extends across the central portion of the City, is thought to be a left-lateral strike-slip fault, similar to the Raymond fault, which is located immediately south of the City. The trace of the Verdugo fault has been mostly obscured by development, except at two locations, at Brand Park in Glendale and at Palm Park in Burbank. Geologic studies to locate the fault at both of these parks have been inconclusive. Therefore, it is proposed that geological studies to evaluate the potential for surface fault rupture should be required for the Verdugo fault only for certain types of development, such as critical facilities. Similarly, geological investigations of the Sycamore Canyon, Hollywood and York Boulevard faults should also be required. For specific information about these requirements, refer to Section 3.1.3 below.

A worst-case scenario earthquake (maximum magnitude) for Glendale would involve rupture of the Verdugo fault, given that this fault lies directly below extensively developed portions of the City. Both the Sierra Madre and Raymond faults can also cause earthquakes that have the potential to severely impact the City. Several other faults farther away have the potential to generate earthquakes that would be felt in Glendale, but these are unlikely to pose a severe threat to property or human life in the City, especially if Glendale prepares for the worst-case (Verdugo fault) event. For example, the San Andreas fault has the highest probability of causing an earthquake in Southern California in the near future, but this fault is sufficiently far from Glendale that ground shaking expected in Glendale as a result of this earthquake is not expected to be any stronger than shaking as a result of earthquakes on faults closer to the City. While building collapse may not be a large risk of the San Andreas rupture, there may be risk of damage to existing water infrastructure and roads that could make getting food, water, and medical supplies into the City more difficult.

Given that the City of Glendale is almost completely built out, the reduction of earthquake losses depends primarily on the prudent retrofitting of existing structures. Glendale has identified and catalogued 703 URM buildings in the City in accordance with Chapter 58 of the City Building and Safety Code, and as of 2024, only 2 URMs had not yet been retrofitted or demolished. This program has significantly reduced the City's seismic vulnerability; however, other potentially hazardous buildings in the City would be identified and retrofitted to reduce even further its vulnerability to strong ground shaking.

Shallow ground water levels (< 50 feet from the ground surface) occur or have occurred historically only in some portions of the City, generally along the Los Angeles River drainage in the southwestern portion of the City, and in the lower reaches of some of the canyons. Shallow ground water has also been reported in the Verdugo Wash area north of the Verdugo fault. Seasonal fluctuations in groundwater levels, and the

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introduction of residential irrigation requires that site-specific investigations be completed to support these generalizations in areas mapped as potentially susceptible to liquefaction (see Plate P-1). Some areas of the City may also be susceptible to seismically induced settlement. Sites near the base of the San Gabriel and Verdugo Mountains, at the valley margins, may be particularly vulnerable as a result of differential settlement at the bedrock-alluvial contact.

The City's hillsides are vulnerable to slope instability due primarily to the fractured, crushed, and weathered condition of the bedrock, and the steep terrain (see Plate P-1). Over steepened slopes along the large drainage channels are also locally susceptible to slope instability. The probability of large bedrock landslides occurring is relatively low; therefore, the source of potential losses due to slope instability arises primarily from the occurrence of smaller slope failures in the form of small slides, slumps, soil slips, debris flows and rockfalls. The initiation of such failures is generally tied to a preceding event, such as wildfire, heavy winter storms, seismic activity, or activities.

There have been four cases of landslides that resulted in property damage in Glendale since 1962: San Gabriel Mountains, San Rafael Hills, and Verdugo Mountains. Glendale is expected to experience an increased probability of landslides due to more frequent and severe wildfires and precipitation events. Landslides pose a threat to communities as Glendale may experience an increase in soil erosion as well as property damage.

Some of the geologic units in the Glendale area may have fine-grained components that are moderately to highly expansive, typically along faults and fracture zones, where the bedrock has been ground to a fine-grained, plastic material. Fine-grained sediments may also occur along the southern portion of the City, in the distal (farthest from the source) portions of the alluvial fans. These fine-grained units may not be present at the surface but may be exposed during grading for construction.

The Environmental Protection Agency and the U.S. Geological Survey have mapped Los Angeles County, California as having a moderate potential for radon gas. However, the EPA warns that structures with elevated levels of radon gas have been found in areas mapped as having a low or moderate potential for radon gas. Therefore, the EPA recommends that all homes be tested for radon gas regardless of geographic location. If a home tests with elevated levels of radon gas, there are several mitigation measures that can be taken to reduce these concentrations to more acceptable levels, although reducing radon gas levels to less than 2 picocuries per liter (pCi/L) is difficult.

GOAL S-1 Seismic Hazards

Goal 1. Reduce the loss of life, injury, private property damage, infrastructure damage, economic losses and social dislocation and other impacts resulting from seismic hazards.

Policy 1-1 **Building readiness for earthquakes.** The City shall ensure that new buildings are designed to address earthquake hazards and shall promote the improvement of existing structures to enhance their safety in the event of an earthquake.

Program 1-1.1 The City shall adopt and enforce the latest version of Title 24 of the California Code of Regulations (California Building Code) with local amendments, including near-source seismic conditions.

Program 1-1.2: The City shall maintain knowledgeable staff that can identify structural deficiencies in buildings and offer information to building owners on effective structural reinforcement options.

Program 1-1.3: The City shall encourage owners of potentially hazardous buildings, whether identified by the State or other governmental entity, to implement seismic safety improvements on those buildings.

Program 1-1.4: The City shall cooperate with the Glendale Unified School District and the Glendale Community College District, as requested, to assist their efforts to improve the structural safety of their buildings.

Policy 1-2: **Local Fault Hazard Management.** The City shall enforce the provisions of the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act, with additional local provisions.

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Program 1-2.1: The City shall require geological studies as part of development proposals in the Fault Hazard Management Zones shown on Plate P-1. The studies shall be conducted by State-certified engineering geologists following the guidelines published by the California Geological Survey (Note 49). The City shall require a State-certified engineering geologist or registered civil engineer, having competence in the field of seismic hazard evaluation and mitigation, to review the study at the applicant's expense. The review shall determine the adequacy of the hazard evaluation and proposed mitigation measures and determine whether the requirements of State law are satisfied, as described in Note 49: Guidelines for Evaluating the Hazard of Surface Fault Rupture by the California Geological Survey, incorporated herein by reference.

Program 1-2.2: The City shall require geological studies as part of development proposals for critical facilities if such facilities are proposed within the Fault Hazard Management Zones of the Verdugo, Mt. Lukens, Hollywood and Sycamore Canyon faults as shown on Plate P-1. The studies shall be conducted in accordance with the California Geological Survey guidelines for surface fault rupture evaluations (Note 49). The City shall require a State-certified engineering geologist having competence in the field of seismic hazard evaluation and mitigation to review the study at the applicant's expense. The review shall determine the adequacy of the hazard evaluation and proposed mitigation measures and determine whether the requirements of State law are satisfied in accordance with Note 49: Guidelines for Evaluating the Hazard of Surface Fault Rupture, by the California Geological Survey.

Program 1-2.3: The City shall require liquefaction assessment studies as part of development proposals in areas identified by the California Geological Survey as susceptible to liquefaction (see Plate P-1). The studies shall be conducted in accordance with the California Geological Survey's Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazards in California, and the Southern California Earthquake Center's (1999) procedures to implement Special Publication 117 – Liquefaction Hazards (both documents incorporated herein by reference). On sites shown to be susceptible to liquefaction, the City shall require the implementation of mitigation measures designed to reduce this hazard to an acceptable level. The City shall require a State-certified engineering geologist or registered civil engineer, having competence in the field of seismic hazard evaluation and mitigation, to review the study at the applicant's expense. The review shall determine the adequacy of the hazard evaluation and proposed mitigation measures and determine whether the requirements of State law are satisfied, as described in Special Publication 117 by the California Geological Survey.

Programs 1-2.4: The City shall require slope stability analyses as part of development proposals in areas identified by the California Geological Survey as susceptible to earthquake-induced landsliding (see Plate P-1). The studies shall be conducted in accordance with the California Geological Survey's Special Publication 117: Guidelines for Evaluating and Mitigating Seismic Hazards in California, and the Southern California Earthquake Center's (2002) guidelines for evaluating and mitigating landslide hazards in California. On sites shown to be susceptible to earthquake-induced slope instability, the City shall require the implementation of mitigation measures designed to reduce this hazard to an acceptable level. The City shall require a State-certified engineering geologist or registered civil engineer, having competence in the field of seismic hazard evaluation and mitigation, to review the study at the applicant's expense. The review shall determine the adequacy of the hazard evaluation and proposed mitigation measures and determine whether the requirements of State law are satisfied, as described in the California Geological Survey's Special Publication 117.

Policy 1-3: **Public Essential Structures and Critical Facilities.** The City shall ensure to the fullest extent possible that, in the event of a major earthquake, essential structures and critical facilities will remain safe and operational. Critical facilities include hospitals, police stations, fire stations, emergency operation centers (as shown on Plate 1-4 of Appendix A: Technical Background

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Report), communication centers, generators and substations, reservoirs and "lifeline" infrastructure (as defined in Section 1.8.3 of Appendix A: Technical Background Report). The vulnerability of some of these critical facilities is summarized in Table 1 (at the end of this document).

Program 1-3.1: The City shall review the seismic vulnerability of critical facilities and "lifelines" in the Alquist-Priolo fault zones and other Fault Hazard Management Zones and make structural changes to those sections of lifelines that cross fault hazard zones that, based on the vulnerability assessment are not anticipated to perform well during an earthquake. Retrofit of these facilities shall be prioritized.

Program 1-3.2: The City shall replace the piping and fittings in those City-owned water tanks that are not currently fitted with flexible, earthquake-resistant joints.

Program 1-3.3: The City shall conduct, in cooperation with the State Office of Dam Safety, an annual review of the dams and water storage facilities in the City. The City shall follow the State's requests in response to these annual reviews.

Policy 1-4: **Application of Seismic and Geological Data to Private Development**. The City shall ensure that current seismic and geologic knowledge and State-certified professional review are incorporated into the design, planning and construction stages of a project, and that site-specific data are applied to each project.

Program 1-4.1: The City shall make available to the public the State's list of all available registered engineering geologists and soils engineers from the State Board of Professional Engineers, Land Surveyors, and Geologists, to review, at the applicant's expense, all geologic and geotechnical reports, including fault studies, for proposed development or redevelopment, and to review grading operations.

Program 1-4.2: The City shall partner with State Board certified geologists or soils engineers to provide the State with updated information on faults, landslide hazards, liquefaction, etc., as such data are generated by project-specific studies. The City shall work with the State to update the seismic hazards maps produced by the State that are relevant to the City.

Policy 1-5: **Public information regarding seismic and geological hazards** The City shall ensure public access to information regarding seismic and geologic hazards.

Program 1-5.1: The City shall regularly review the technical data on public safety and seismic safety for use in the planning process and undertake revisions or updates to the Safety Element as needed. This includes replacing maps with updated maps obtained from the State of California.

Program 1-5.2: The City shall develop a web-based system to communicate information about seismic and geologic hazards to the public, and describe strategies that people can implement at home and the workplace to reduce economic losses and improve personal safety.

Program 1-5.3: The City shall promote earthquake preparedness with publications available in various languages spoken in the community.

Program 1-5.4: The City shall provide its residents with information about the hazards posed by radon gas, with emphasis on published sources and resources available on this subject.

GOAL S-2 Geologic Hazards

Goal 2. Reduce the loss of life, injury, private property damage, infrastructure damage, economic losses and social dislocation and other impacts resulting from geologic hazards.

Policy 2-1: **Development in geologically hazardous areas.** The City shall avoid development in areas of known slope instability or high landslide risk when possible and will require that developments on sloping ground use design and construction techniques appropriate for those areas.

Program 2-1.1: The City shall require geological and geotechnical investigations in areas of potential seismic or geologic hazards as part of the environmental and development review process. The City will not issue permits for development or redevelopment until assured that all potential geologic hazards have been mitigated.

Program 2-1.2: The City shall require preliminary geological investigations of tract sites by State-registered geotechnical engineers and certified engineering geologists (in accordance with the California Building Code and the City of Glendale's Grading, Fills and Excavations Code – City Code 15.12).

Program 2-1.3: In those areas of Glendale susceptible to slope instability, the City shall require geotechnical investigations that include engineering analyses of slope stability, provide surface and subsurface drainage specifications, and provide detailed design for fill placement and excavation.

Program 2-1.4: The City shall discourage any grading beyond that which is necessary to create adequate and safe building areas. The City shall conduct regular inspection of grading operations to maximize site safety and compatibility with community character.

Program 2-1.5: The City shall prohibit grading that is inconsistent with the Grading Ordinance. The City shall encourage the use of varied slope ratios on manufactured slopes to reduce the visual impact of grading.

Program 2-1.6: The City shall prohibit reconstruction of structures meant for human habitation that were damaged or destroyed by failed slopes unless the applicant can prove that the remedial measures proposed will improve the unstable slope conditions such that the site is suitable for development.

Policy 2-2: **Slope stability monitoring near evacuation routes.** The City shall consider monitoring slope stability in areas adjacent to designated evacuation routes and critical facilities to minimize increasing risk of landslides due to climate-change related increases in wildfires and extreme precipitation events. (CCVA)

Program 2-2.1: The City shall consider establishing a regular inspection and maintenance cycle for existing physical landslide and debris flow defenses, including inspections prior to heavy rain events and post-wildfire events. (CCVA)

Program 2-2.2: The City shall consider implementing the following strategies to address increasing vulnerabilities associated with debris flow and landslides: upgrading and improving drainage capacity, reconstructing retaining walls, installing netting and vegetation, avoiding clear cutting, and stabilizing the soil after tree clearing, such as with compost and mulch. (CCVA)

Program 2-2.3 The City shall consider identifying locations where slopes should be actively monitored and installing landslide monitoring equipment especially in landslide susceptible areas near evacuation routes and critical assets to detect any changes in local hillside hydrologic conditions. (CCVA)

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3.2 Flooding Hazards

3.2.1 OVERVIEW

Rain in Southern California is generally a welcomed event – it cleans the air, makes our hills and mountains green, and provides water for drinking and recreation. Intense or prolonged rainfall, however, can cause problems in areas where people have encroached onto the floodplain, modified the landscape and built structures in areas meant to convey excess water during floods. Communities may experience overflowing river channels, flooded streets and basements, mudflows and debris flows at the mouths of canyons, and other similar conditions that can cause extensive damage to property, injuries, and, in some cases, loss of life.

In developed areas, extensive **impervious surfaces** (such as pavement, buildings, and concrete walkways) cause most precipitation to be collected as runoff. Storm drain systems are typically designed to safely carry the runoff through the area without ponding or flooding. However, plugged or partially obstructed storm drain inlets can significantly reduce the ability of the storm drain system to collect and convey the water. Regular inspection and maintenance of the storm drain system is required to remove any obstructing debris.

The Federal Emergency Management Agency (FEMA) defines the "**base flood**" or "**100-year flood**" as a flood that has a 1-percent or greater chance of being equaled or exceeded during any given year. A base flood has a 26-percent chance of occurring during a 30-year period, generally the length of most home mortgages. However, the recurrence interval represents the long-term average period between floods of a specific magnitude; rare floods could occur at short intervals or even within the same year.

Seismically induced inundation refers to flooding that results when water retention structures (such as dams) fail due to an earthquake. Dams greater than 25 feet in height or reservoirs with more than 50 acre-feet in storage capacity are required to have inundation maps that show the potential flood limits in the event that the dam is breached catastrophically. Inundation maps are prepared for emergency preparedness planning, and in no way reflect the structural integrity or safety of the dam in question.

3.2.2 LOCAL CONDITIONS

While Glendale is not within the 100-year or 500-year FEMA floodplain zone, the City is at risk of flooding during extreme precipitation events. In the case of atmospheric rivers, the stormwater drainage system may be overwhelmed and increase flood vulnerability in Glendale. The Verdugo Wash is the main flood control channel in the City, separating Glendale into quadrants. The Verdugo Wash flows southeast to south, and cuts through a rising block of bedrock that we now refer to as the Verdugo Mountains on the west, and the San Rafael Hills on the east. Once it clears the Verdugo Mountains, the Verdugo Wash veers west-southwest and eventually drains into the Los Angeles River near the intersection of the Golden State (I-5) and Ventura (SR-134) Freeways. The Verdugo Wash and several of its tributaries have been confined to man-made channels since the late 1930s. In most years, this system carries little water, with peak discharges typically less than 500 cubic feet per second (cfs). Records indicate however, that the area experiences severe wet winters, and Verdugo Wash then carries peak flows exceeding 51,480 cfs.[4] Due to climate change, some segments of the Verdugo Wash will experience an increase in peak flood flows as described later in this section.

Historical records show that historical peak discharges in the Glendale area have occurred most often between November and March, indicating that future flooding in the City is most likely to occur in the winter months. Storm events can generate debris flows in the upper reaches of the watershed, at and near the base of the San Gabriel Mountains, and at the base of the Verdugo Hills. This is more likely to happen in wet years in areas recently burned by wildfires. Debris flooding has occurred previously in many of the canyons near the Glendale area. For example, the worst storm recorded in the area occurred in 1934, following a wildfire burn in the same area that had occurred two months earlier. As a result of these two events, the storm waters carried large amounts of debris. Roads were choked, bridges were washed out, several people died, and erosion and sedimentation damaged property. The Verdugo Wash was constructed in response to this flood event.

Post-wildfire debris and associated landslides can increase the vulnerability of critical facilities such as schools, fire and police stations, and water pump stations. Debris flows can block waterways and stormwater

[4] Verdugo Wash. 2022. Verdugo Wash Vision Report. https://www.verdugowash.com/ (accessed October 2024).

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drains which can cause roads to flood and obstruct roadways, especially following wildfires. Therefore, with increased extreme precipitation and wildfire events, Glendale may experience increased debris flow. The Glendale Water & Power (GWP) Wildfire Mitigation Plan outlines procedures for vegetation management, wildfire power safety shutoffs, and other activities to reduce infrastructure vulnerabilities. Implementing policies to manage increased debris due to climate change hazards can reduce vulnerability to critical facilities and increase overall resilience.

A study of Verdugo Wash conducted in 1978 for the Los Angeles Department of Public Works shows that the channel could accommodate the estimated peak flows everywhere, except in the area immediately north of where Verdugo Wash joins the Los Angeles River. Two recent studies were conducted to better understand the current needs and conditions of the Verdugo Wash. In 2015, the US Army Corps of Engineers developed a review plan to analyze repair needs for the Verdugo Wash. Another study, the 2022 Verdugo Wash Visioning report, models the capacity of the Verdugo Wash with considerations around future climate change projections. The impacts of climate change will increase the risk of flooding due to an increase in peak flows along the Verdugo Wash. Flow rates vary through different segments of the Verdugo Wash range from 9,665 cfs to 51,480 cfs. The modeling indicates that in the Henderson Canyon segment, which is the northern most 2.5 mile area of the Verdugo Wash, there could be an overflow. In fact, this area is known to flood regularly during winter storms dating back to the 1978 study. In the southern segment of the Verdugo Wash, peak flows will overflow at the Confluence segment. Nevertheless, in 1979, the FEMA determined that, “for all practical purposes no part of the community would be inundated by the base flood. . .”, and therefore, that the entire community would be classified as Zone C (area of minimal flood hazards where the purchase of flood insurance is not mandatory). In 1984, FEMA again informed the City that no Special Flood Hazard Areas were present within the corporate limits of the City at that time, and thus that the City was placed in Zone D, which has no mandatory flood insurance purchase requirements. In 2008, FEMA prepared Flood Insurance Rate Maps (FIRM) and the City of Glendale was placed in Zone D. Glendale is a future participant of FEMA’s Community Rating System (CRS) as part of the National Flood Program. With over 1,500 communities participating nationwide, the CRS is a voluntary incentive program encouraging community floodplain management practices beyond the minimum requirements of the National Flood Insurance Program (NFIP).

There are five dams in the Glendale area, Brand Park, Diedrich Reservoir, Glenoaks 968 Reservoir, Chevy Chase 1290, and East Glorietta, that are large enough that the State requires that inundation maps for these facilities be available, plus several other debris basins, such as the Oakmont Debris Basin at the northerly end of the Verdugo Wash and Brand Debris Basin Dam Number CA 01152, which are not owned nor operated by the City (owned by Los Angeles County of Public Works).. All of the larger structures are more than 50 years old and were therefore most likely not designed to withstand the strong ground shaking that the area is thought capable of experiencing given the several nearby seismic sources. Diederich Reservoir and Brand Park Dam are located within the Fault Hazard Management Zone for the Verdugo fault, and possibly just north of the fault trace. East Glorietta Dam is located in an area thought to be susceptible to liquefaction. The 10th and Western 5-004 dam, also known as the Western Reservoir, is located near, but south of the Verdugo fault. Glenoaks 968 Reservoir is located in an area where several inactive faults have been mapped; however, secondary faulting in response to movement on other faults could occur in the area. In addition to the dams, there are 12 potable and 4 recycled water storage tanks in the City. Three of these tanks are located within the fault hazard management zone for the Sierra Madre fault. Most, but not all, of these tanks are fitted with flexible joints that can accommodate some of the lateral and vertical movements associated with an earthquake.

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

Flooding can occur because of overwhelmed stormwater systems. When an influx of stormwater exceeds a drainage system’s capacity to infiltrate water into the soil or to carry it away, localized stormwater flooding can occur. Urban landscapes tend to be built with impermeable surfaces that do not allow much water to infiltrate the ground and this increases the amount of runoff that must be channeled in storm drainage systems and carried elsewhere. Most urban drainage infrastructure was not built to manage stormwater flows from the increased precipitation events that are occurring and will occur more frequently with climate change

and can be costly to retrofit. As a result, the costs and impact of urban flooding are expected to increase as precipitation patterns become more extreme due to climate change.

Flooding impacts directly create physical damage from inundation while also increasing risks to the community. Flooding can lead to cascading risks due to loss of power, wastewater management issues, pollution and hazardous materials carried by stormwater, and overwhelmed storm drainage infrastructure, exacerbating public health concerns. Road closures and power outages will cause disruptions to commuters and to residential and commercial development.

GOAL S-3 Flooding Hazards

Goal 3. Reduce the loss of life, injury, private property damage, infrastructure damage, economic losses, and social dislocation and other impacts resulting from flooding hazards.

Policy 3-1: **Flood Control Measures**. The City shall investigate the potential for future flooding in the area and will encourage the adoption of flood-control measures in low-lying areas of alluvial fans, along major channels, and down-gradient of large reservoirs and water tanks.

Program 3-1.1: The City shall participate in the National Flood Insurance Program.

Program 3-1.2: The City shall discourage additions to, or the reconstruction of, critical facilities if such facilities are located in dam or reservoir inundation pathways (shown on Plate P-2) unless it can be demonstrated that the proposed project and any occupants will be protected from dam or reservoir failure.

Program 3-1.3: The City shall evaluate the potential impacts to the flood control system during the environmental review process for new buildings or building additions. Hydrological studies to assess the impacts shall be required if determined necessary by the City. Potential impacts shall be fully mitigated.

Program 3-1.4: The City shall maintain City-owned storm drain facilities, consistent with the City's Stormwater and Urban Runoff Pollution and the Safe, Clean Water Program, to prevent the accumulation of debris or other obstructions that would hamper the effectiveness of the system during rainy days.

Program 3-1.5: The City shall upgrade stormwater systems on City-owned properties and rights-of-way to limit flooding from extreme precipitation events while also improving water filtration and quality. Deployment of such strategies such as green infrastructure (bioswales) shall be prioritized in high socially vulnerable census tracts in alignment with the Climate Action and Adaptation Plan (CAAP). (CAAP)

Program 3-1.6: The City shall contact the Los Angeles County Flood Control District to discuss implementing flood mitigation measures to mitigate increased flood risk along the Verdugo Wash, in particular in the Henderson Canyon segment which is the northernmost 2.5 mile area of the Verdugo Wash.

3.3 Fire Hazards

3.3.1 OVERVIEW

Since the 1970s, several different methods to map the wildfire hazard of an area have been developed. Many of these methods rely on a point system that considers the type and amount of vegetation, termed **fuel loading**, slope gradient, weather, dwelling density, access, level of service provided by the local fire department, and past fire history of an area in determining its fire hazard. Areas with a high fire hazard at the urban-wildland interface have to follow, at a minimum, the model ordinance adopted by the California Fire Marshal, but individual jurisdictions can have more stringent requirements. These requirements include vegetation management practices to create a defensible space around structures (**defensible space** is a zone of thinned vegetation that helps slow the rate and intensity of a fire and provides space for fire-fighters to set up to suppress the fire and save the threatened structures), fire-resistive building materials, and minimum access road criteria.

More people than ever now live and play in or at the **wildland-urban interface**, an area with a high fire hazard, especially if large amounts of combustible vegetation have been allowed to accumulate over time as a result of the fuel management practices common during a large part of the 20th Century. If a wildfire spreads onto the built environment, multiple structural ignitions can develop in a short period of time due to wind transport of brands or cinders. Fires at the urban-wildland interface can be particularly dangerous and complex, posing a severe threat to public and firefighter safety, and causing devastating losses of both life and property. This has happened at several high-profile fires at the urban-wildland interface in the last 15 years (e.g., the 2020 August Complex in the Humboldt area, the Dixie Fire 2021 in the Butte-Plumas County area, and the 2017 Santa Barbara fire). A notable fire in the City's history was the College Hills fire of June 1990, which burned 100 acres and destroyed 64 homes in the foothills of the San Rafael Hills. More recent fires have occurred in City limits burning 1,629 acres in the 2000s (161,582 acres burned in total) and 399 acres in the 2010s (7,051 acres burned in total).

Unlike wildfires at the urban-wildland interface, which appear to be increasing in number and dollar loss, the number of structural fires in the developed portions of cities has decreased over time, in great part due to the use of fire-resistive building materials and internal fire sprinklers, smoke detectors and fire alarms, and the faster response by better trained fire-fighters with better equipment. Nevertheless, earthquakes can generate structural fires that have the potential to severely tax the local fire suppression agencies, especially if the water supply system is impaired due to damage to the water reservoirs and/or water mains.

3.3.2 LOCAL CONDITIONS

The portions of the San Rafael Hills and the Verdugo and San Gabriel Mountains within City limits are mapped as having a high fire hazard due to the steep topography of the area, the presence of flammable vegetation, and limited access (see Plate P-3). In fact, Glendale's Fire Department places nearly two-thirds of the City in the high fire hazard area. The historical record supports this mapping: since the late 1800s, the entire northern two-thirds of the City has burned at least once. The Glendale climate often contributes to the fire risk. Dried out vegetation from the hot summer months is exposed to Santa Ana wind conditions in the fall. Such winds become extremely erratic when combined with winds generated from burning vegetation and can stress fire-fighting resources and reduce fire-fighting success. In addition, large mountainous areas in Glendale contain rough topography which not only facilitates the spread of fire, but also impedes or hinders responding fire-fighting personnel and equipment. Traffic congestion in the urban areas and long travel distances and narrow, winding roads in the hillsides and mountains also can hinder fire department response to the urban-wildland interface areas. These areas have a history of fires, with some areas experiencing a wildland fire at least once a decade. Residents in all of these areas must be informed that they live in a hazardous area, and that they are responsible for maintaining their properties. This includes, but is not limited to, establishing a fire-resistant landscape consistent with Glendale's 1993 Hillside Management Plan, and building with fire-resistant materials in accordance with Glendale's Building and Safety Code. In addition, the Fire Zone Management Guidelines recommends using the Hillside Management Plan's two suggested plant palettes around flammable structures with certain buffer requirements. This is especially critical in some of the older, pre-fire planning developments in the mountainous, high-fire hazard areas where access is limited by narrow roads with no secondary outlet and steep grades, which hamper the Fire Department's response.

To reduce the wildland fire hazard, especially at the wildland-urban interface, the City of Glendale has adopted an aggressive fuel modification ordinance that requires property owners to maintain a defensible space around their properties. The Fire Department conducts annual inspections of residences and lots in the City to ensure compliance with the fuel modification ordinance, and issues notices of violation where appropriate. Glendale should continue to require property owners to conduct maintenance on their properties to reduce the fire danger in accordance with the City's Building and Fire Safety Codes.

Fire hazards could also result in direct and indirect impacts on power delivery to Glendale community members. There are three overhead transmission lines owned and operated by GWP that pass through the Very High Fire Hazard Severity Zones in north Glendale. Glendale Water & Power (GWP) engages in several programs to reduce the impacts associated with potential power disruption due to wildfire events. According to the GWP Wildfire Prevention Mitigation Plan, GWP has a Public Safety Shutoff Events program that involves providing 24–48-hour advanced notice as well as more immediate shutoff notifications to limit risk of triggering a wildfire and to avoid damaging electrical infrastructure from peak demand periods. Since wildfires are most often triggered by vegetation coming into direct contact with electric utilities, GWP also maintains a Vegetation Management Plan to reduce risks (City of Glendale 2022). In addition, impacts anywhere along those transmission lines outside of Glendale could also cause issues within Glendale if

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enough capacity is not available locally to meet demand. Several major earthquake-generating faults within the City of Glendale could trigger multiple fires (such as from downed electrical lines or broken gas mains), disrupt **life-line services** (water supply), and trigger other geologic hazards, such as landslides or rock–falls, which could block roads and hinder emergency response. In addition, freeways, railways, and pipelines within the City of Glendale introduce significant fire and other risks for which the City must respond. Earthquake-induced fires pose a risk in the developed, downtown areas of the City, the result of downed electric lines, broken gas mains, and tipped-over appliances. Loss estimation models conducted in 2003 indicate that earthquakes on the Sierra Madre, Verdugo, Raymond, and Hollywood faults have the potential to cause significant fire-after-earthquake losses in the City of Glendale. Multiple ignitions over a broad area of the City can tax the local Fire Department, especially if the water reservoirs or water mains are also damaged during the earthquake.

Most development in Glendale occurs in the flatlands, where the predominant housing type is multiple-family units (apartments and condominiums) that have special fire protection needs. To that end, City ordinances require all mid-rise and high-rise buildings to have fire and life safety systems in place, including automatic fire sprinklers and smoke detectors. The specific construction requirements are contained in the Glendale Building and Safety Code (Volume I, Section 715 which deals with construction requirements in fire hazard areas, and Volume VI, which pertains to fire and life-safety requirements).

The Glendale Fire Department (GFD) is responsible for fire suppression in the City. Nine fire stations are strategically located throughout the City to provide the level of service that has gained the GFD an Insurance Services Office (ISO) rating of 1, the highest rating possible (at this time, only 329 communities in the United States have been awarded an ISO rating of 1). The GFD responds to more than 90 percent of the emergency calls within 6 minutes of receiving the call at dispatch. The City of Glendale has adopted ordinances that exceed the minimum State requirements for fire hazard abatement. These ordinances include the requirement that all new roofs and re-roofs amounting to more than 25 percent of the original roof area to be done in Class A roofing materials. The Class A roof-covering ordinance first applied only to structures within the high fire hazard area but is now enforced Citywide. Since 1989, the City has also required internal fire sprinklers in all new residential one- and two-family structures. Most of the City-adopted ordinances have become effective years ahead of the rest of California, setting an example for other communities

A twenty-year Glendale incident history shows that the number of incidents reports has doubled from 11,000 calls in 2003 to 22,000 calls in 2023, reflective of the population growth experienced. The number of medical emergencies compared to fire calls has increased over time and represent nearly 80 percent of all Fire Department incident calls. If the number of medical emergency responses continue to increase (which is likely, considering the aging population), and this is found to have an impact on the availability of fire-fighting personnel and equipment, it may be prudent to add another rescue ambulance and support squad vehicle and increase staffing at the fire station in the area of the City with the highest rate of medical incidents.

The GFD has several proactive programs in place to reduce the fire hazard in the City. It participates in the plan review of nearly all buildings, discretionary approvals, and other development (both public and private). This review ensures that all new projects have Fire Department “master planning” incorporated in their design. The Fire Department has full-time fire investigators that work closely with the Police Department, and it participates in several educational programs. This includes Fire Department personnel assigned full-time to public education, contracting with a private professional acting company to perform fire safety plays. The Jr. Fire Program aims to engage with children in elementary school to teach the importance of fire safety and emergency preparedness. The program hosts an annual picnic with games and prizes for students that participate in an essay and drawing contest within the Glendale Unified School District and other youth groups.

In regards to emergency response, the Glendale Fire Department requires **EMT-D** (Emergency Medical Technician - Defibrillator) certification of all of its firefighters and Ambulance Operators and requires at least one member on each apparatus be **EMT-P** (Paramedic) certified. The Glendale Fire Department has mutual aid agreements with the larger surrounding agencies of Los Angeles City Fire Department and Los Angeles County Fire Department. Additionally, the Department has a joint powers agreement with Pasadena and Burbank to dispatch through the Verdugo Joint Fire Communications Center for which covers Fire Departments for 13 cities including the Hollywood Burbank Airport. The Verdugo Joint Fire Communications Center coordinates emergency calls for the cities of Glendale, Burbank, Pasadena, South Pasadena, Arcadia, Alhambra, Sierra Madre, San Gabriel, San Marino, Monterey Park, Montebello, West Covina, and the Hollywood Burbank Airport. The Department has several interdepartmental agreements that ensure cooperation for emergency response (for example, Fire has an agreement with the Glendale Water and

Power Department for automatic dispatch upon second alarm). It has automatic aid agreements with the adjacent cities of Burbank, Pasadena, and Los Angeles, and the County of Los Angeles. Also, it is partly to an agreement that authorizes calls for emergency response to be dispatched through the Verdugo Joint Fire Communications Center, which coordinates 49 different stations in the region, which includes stations from Glendale, Burbank, Pasadena, San Marino, South Pasadena, Monrovia, Arcadia, Sierra Madre and San Gabriel. The City of Glendale activity participates in the Standardized Statewide Emergency Management System (SEMS).

The California Department of Forestry and Fire Protection (CAL FIRE) has mapped **Fire Hazard Severity Zones** throughout California. The Fire Hazard Severity Zone (FHSZ) maps are developed using a science-based and field-tested model that assigns a hazard score based on the factors that influence fire likelihood and fire behavior. Many factors are considered such as fire history, existing and potential fuel (natural vegetation), predicted flame length, blowing embers, terrain, and typical fire weather for the area. There are three levels of hazard in the State Responsibility Areas: moderate, high, and very high. Currently only Very High Fire Hazard Severity Zones (VHFHSZs) are identified for local government jurisdictions; VHFHSZs in Glendale include the Verdugo mountains and Chevy Chase mountains. These VHFHSZs are considered **Local Responsibility Areas (LRA)**, meaning that the City of Glendale is responsible for fire protection within these areas. The large amounts of open space and wildland make Glendale susceptible to brush fires year-round. The proximity of native vegetation and the climate of the region contribute to sections of the City having VHFHSZs, as illustrated in Plate-3.

Critical facilities are facilities in either the public or private sector that provide essential products and services to the public, are otherwise necessary to preserve the welfare and quality of life in the City, or fulfills important public safety, emergency response, and/or disaster recovery functions. The City's critical facilities include schools, fire stations, police stations, transportation systems, libraries, parks, City Hall, hospitals, and utility systems. According to Plate P-3, there are 2 libraries, 5 fire stations, 1 police station, 1 landfill, 1 hospital, 8 schools, 1 water treatment plant, 23 Potable/Recycled Water Pump Stations, 20 parks, and transmission lines located in the VHFHSZs.

The frequency, area, and severity of wildfires have increased significantly within Los Angeles County over the past two decades. Wildfire events are a product of temperature increases compounded with precipitation declines creating wildfire prone conditions. Glendale has a history of wildfires in the past 50 years and due to climate change, projected annual wildfire probability is expected to increase by 30 percent by mid-century. Wildfires may lower water quality, cause power delivery disruption and property damage, increase habitat loss, and strain emergency services**.** In addition, communities may experience impacts on public health, air quality decline, fatal and non-fatal injuries, and income loss due to high exposures to wildfire smoke. Wildfires that burn within City limits can pose a significant threat to community members and can burn homes.

GOAL S-4 Fire Hazard

Goal 4. Reduce the loss of life, injury, private property damage, infrastructure damage, economic losses and social dislocation and other impacts resulting from fire hazards.

Policy 4-1: **Fire Service and Response**. The City shall ensure to the extent possible that fire services, such as fire equipment, infrastructure, and response times, are adequate for all areas of the City. (CAL FIRE)

Program 4-1.1: The City shall conduct annual fire flow tests, especially in areas of high fire hazard, and shall implement water system improvements for hydrants and fire flow.

Program 4-1.2: The City shall prepare periodic Fire Station location and Resource studies.

Program 4-1.3: The City shall ensure that road standards meet the needs for emergency access.

Program 4-1.4: The City shall improve emergency access for areas currently below standard.

Program 4-1.5: The City shall install traffic signal pre-emption devices for fire response at critical intersections.

Program 4-1.6: The City shall evaluate the impact of traffic calming measures on emergency response times.

Program 4-1.7: The City shall monitor and identify current trends (including population and settlement patterns, incident trends, and changes in the economic, social and/ or cultural makeup of the community) that may impact the City's ability to provide adequate emergency services.

Program 4-1.8: The City shall conduct studies to determine whether improvements are needed in the areas of public education and fire prevention.

Program 4-1.9: The City shall ensure that road standards meet the needs for emergency access and that access roads are not restricted by parked cars. (CAL FIRE)

Program 4-1.10 The City shall coordinate with telecommunication service entities, and the Los Angeles County Cable and Telecommunications Office to fire-harden communications. (Attorney General Wildfire Guidance)

Program 4-1.11 The City shall ensure that adequate equipment, staffing, training, and resources are provided to the Glendale Fire Department to meet current and future projected service demands and fire protection needs. Review new developments in Very High Fire Hazard Severity Zones to ensure that adequate fire protection provisions are in place, including fire flow and emergency vehicle access. (CAL FIRE)

Program 4-1.12 The City shall coordinate with the Glendale Water Department, Metropolitan Water District of Southern California, and other water districts as appropriate to support the provision of adequate water and water storage throughout the city to meet future peak fire demands during times of peak domestic demand. Explore the feasibility of providing on-site water supply and storage to augment ordinary supplies that me be lost during a wildfire.

Policy 4-2 **New Development**. The City shall require fire protection plans for all new developments and discourage new residential development within Very High Fire Hazard Severity Zones, where feasible. Ensure fire protection plans include risk analysis, consideration of increased wildfire hazards due to climate change, fire response capabilities, fire safety requirements, fuel management, mitigation measures and design requirements, and wildfire education maintenance and limitations. Limit new development in areas with single access points in and adjacent to steeply sloped terrain (greater than 40 percent slope) that would result in significant and unavoidable impacts relating to rapid wildfire spread.(CAL FIRE, Attorney General Wildfire Guidance)

Program 4-2.1: The City shall encourage residents to plant and maintain drought-resistant, fire-resistant landscape species to reduce the risk of brush fire and soil erosion in areas adjacent to canyons, and develop stringent site design and maintenance standards for areas with high fire hazard or soil erosion potential.

Program 4-2.2: The City shall enforce the Weed Abatement Program in high fire hazard areas.

Program 4-2.3: Fuel management plans shall be required for all new development in areas subject to wildfire.

Program 4-2.4: The City shall enforce the Uniform Fire Code and Municipal Fire Code Amendments for new construction in fire hazard areas, including the use of sprinklers in residential structures.

Program 4-2.5: The City shall consider fire safety issues during revisions to the Zoning Ordinance.

Program 4-2.6: The City shall develop a program for monitoring and enforcing environmental mitigation measures or conditions of approval applied to projects.

Program 4-2.7: The City shall enforce a Class A Roofing ordinance or better for residential and commercial developments. Residents with existing wood-shingle or unrated roofing materials shall be encouraged to upgrade to fire resistive building materials, including fire resistive eaves and awnings.

Program 4-2.8 The City shall require that new subdivision tract maps for thirty or more lots provide adequate access (ingress, egress) and a minimum of two roadways with widths and lengths in compliance with the Board of Forestry and Fire Protection's State Minimum

Fire Safe Regulations Article 2, Subsection 1273. (Attorney General Wildfire Guidance)

Program 4-2.9: Whenever feasible, the City shall locate new essential public facilities, including health care facilities, emergency shelters, and fire stations, outside Very High Fire Hazard Severity Zones. (CAL FIRE)

Policy 4-3 **Redevelopment**. The City shall require that, after a large fire, redevelopment of a damaged property in a Very High Fire Hazard Severity Zone complies with the requirements of construction and includes adequate provisions for emergency access, vegetation management, and firefighting, in compliance with current fire codes. (CAL FIRE)

Policy 4-4 **Existing Non-Conforming Development.** The City shall minimize risks to existing development by identifying existing non-conforming development that does not meet local and state contemporary fire safety standards in terms of road standards and vegetative hazard and require all new development to meet or exceed the City of Glendale Vegetation Management Program (VMP) Defensible Space Guidelines and the California Code of Regulations, State Responsibility Areas Fire Safe Regulations. (State Responsibility Areas Fire Safe Regulations), (City of Glendale Vegetation Management Program Defensible Space Guidelines). (CAL FIRE)

Policy 4-5 **Water Supply.** The City shall evaluate the City's fire suppression capacity and future water supply availability, as part of the next Glendale Local Hazard Mitigation Plan, which is updated every 5 years. (CAL FIRE)

Program 4-5.1 The City shall coordinate with Glendale Water & Power and other water districts as appropriate to support the provision of adequate water throughout the City and provision of adequate water storage to meet future peak fire demands during times of peak domestic demand. Explore the feasibility of providing on-site water supply and storage to augment ordinary supplies that may be lost during a wildfire. (CAL FIRE, Attorney General Wildfire Guidance)

Program 4-5.2 The City shall require all new developments to have adequate water supply to meet fire suppression needs and comply with applicable fire flow requirements. (CAL FIRE)

Policy 4-6 **Electrical Undergrounding.** The City shall implement an aggressive electrical undergrounding plan with a focus on critical evacuation roadways and areas with the highest wildfire risk. (Attorney General Wildfire Guidance)

Policy 4-7 **Defensible Space.** The City shall require all properties in the City to implement precautionary measures to create defensible space in compliance with regulations set forth in Senate Bill 63, Assembly Bill 3074, and Glendale Fire Department defensible space standards and guidelines. The City shall continue annual brush inspections, require public and private properties in the City to maintain a fire break around structures. (CAL FIRE, Attorney General Wildfire Guidance)

Program 4-7.1 The City shall enforce development and maintenance of buffer zones and defensible space by requiring the removal of brush and flammable vegetation surrounding public and private properties and the upkeep of an ember resistant zone around structures located in Very High Fire Hazard Severity Zones. The City shall also require public and private properties to maintain any tree adjacent to or overhanging any building free of dead or dying wood, and maintaining roofs free of leaves, needles, or other dead vegetation growth. (CAL FIRE, Attorney General Wildfire Guidance)

Program 4-7.2 The City shall encourage residents to plant and maintain drought-resistant, fire-resistant landscape species to reduce the risk of brush fire and soil erosion in areas adjacent to canyons and develop stringent site design and maintenance standards for areas with high fire hazard or soil erosion potential. (CAL FIRE)

RPC 2(b)(ii)

Policy 4-8 **Emergency Plan.** The City shall review and update the Emergency Operations Plan and evacuation protocols every two years as recommended by CESA and Cal OES, if feasible, to consider current community emergency evacuation needs in response to wildfires, including in Very High Fire Hazard Severity Zones. (CAL FIRE)

Program 4-8.1 The City shall establish minimum standards for evacuation and emergency vehicle access to and from new or planned development including regulations for weight and vertical clearance, dead-end, one-way, and single lane conditions.

Policy 4-9 **Educational Awareness.** The City shall educate residents on fire hazard reduction strategies to employ on their properties, focusing on the most vulnerable populations such as older adults, individuals with disabilities, non-English speaking residents, and individuals with chronic health conditions. (CAL FIRE)

Program 4-9.1 The City shall host educational workshops for property owners on defensible space, home hardening, and vegetation management based upon the most up-to-date science and State guidelines to reduce wildfire risk. Target education of most up-to-date evacuation routes to at-risk populations including older adults and individuals with chronic health conditions. (CAL FIRE, Attorney General Wildfire Guidance)

Program 4-9.2: The City shall conduct studies to determine whether improvements are needed in the areas of public education and fire prevention. (CAL FIRE)

Policy 4-10 **Partnerships.** The City shall regularly review and update mutual aid agreements between surrounding City Fire Departments and the Glendale Fire Department to reflect new developments, population trends in the City, station staffing/equipment, and fire behavior shifts due to climate change. Ensure protections and response for all areas are adequately covered by the appropriate updates. (CAL FIRE)

3.4 Climate Change

3.4.1 OVERVIEW

The Safety Element includes the impacts of climate change in the City of Glendale, as required by Government Code Section 65302(g). Climate change is caused by the release of **Greenhouse Gases (GHG)** into the atmosphere, which traps heat near the Earth's surface raising global average temperatures in what is referred to as the "**greenhouse effect**." This increase in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry (NASA 2022). According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years (IPCC 2021). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian (e.g., cultivation of land) and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2022).

The IPCC has established various GHG emissions scenarios to communicate impacts to climate indicators including the rate of average temperature, precipitation, and sea level rise by mid and end of the century. These climate indicators will determine future impacts to climate hazards including extreme heat, drought, wildfire, landslides, extreme precipitation and stormwater flooding, and air quality. These emissions scenarios are referred to as **Representative Concentration Pathways (RCPs)**. Two of these RCPs are commonly used to compare possible futures and were selected for the City's 2024 Climate Change Vulnerability Assessment, consistent with guidance from the California Government Office of Emergency Services (Cal OES) California Adaptation Planning Guide. The two scenarios used for the climate vulnerability assessment are RCP 4.5 which represents a "medium emissions" scenario, and RCP 8.5 which represents a "high emissions" scenario.

3.4.2 LOCAL CONDITIONS

The City prepared a **Climate Change Vulnerability Assessment** (Appendix B), consistent with Government Code Section 65302(g) and as amended by SB 379, which assesses how the communities and assets in Glendale are vulnerable to climate change. Two types of vulnerabilities are identified: social and physical

RPC 2(b)(ii)

vulnerabilities. Climate risk and impacts in Glendale vary geographically based on exposure, socio-economic characteristics, and physical conditions in various parts of the City. The following section provides an overview of key findings from the Glendale Climate Change Vulnerability Assessment.

Social vulnerability is the likelihood of community members to experience adverse impacts of climate change due to existing health conditions, historical marginalization, or limited access to critical resources. Impacts include disproportionate death, injury, loss, or disruption of livelihood. Some notable vulnerable populations in Glendale that are disproportionately susceptible to climate change impacts are individuals diagnosed with high blood pressure (28%), Black, Indigenous, People of Color (BIPOC) (23%), seniors (18%), limited or non-English speakers (11%), outdoor workers (8%), and people who use active transportation (9%). **Vulnerable populations** are concentrated in southwest, central, and south Glendale. These areas have the lowest tree equity score indicating there is a deficiency in the distribution of trees for a community to experience climate benefits. The most under-resourced communities such as low-income households and, BIPOC communities are disproportionately impacted by extreme heat because of factors such as the **Urban Heat Island (UHI) effect**. UHI occurs when natural land cover is replaced with hard surfaces such as pavement, buildings, and other surfaces that absorb heat. This can increase energy costs, air pollution, and heat-related illness.[5] Historical redlining, a discriminatory zoning practice that exacerbated racial segregation, has also left a legacy of unhealthy conditions in under-resourced communities making them more susceptible to climate impact such as extreme heat. According to the vulnerability assessment, the highest concern for social vulnerability is increased extreme heat and poor air quality.

Physical vulnerability is the susceptibility and limitations of physical infrastructure in the context of climate hazards and extreme events. Climate change has the capacity to harm physical infrastructure and disrupt services or restrict accessibility. Glendale can experience adverse effects from climate change with damages to natural and recreational resources, buildings and facilities, and infrastructure and critical services. Physical vulnerabilities for infrastructure and critical assets include the risk of wildfire and post-wildfire landslides while natural and recreational resources are vulnerable to extreme heat, wildfire, drought, and poor air quality. Robust infrastructure is a crucial element in enhancing Glendale's resilience and examining the vulnerability of critical infrastructure will offer insight on how climate change will impact them.

An increase in extreme heat events can increase the probability of heat-related illnesses such as heat stroke, heart attack, dehydration, and respiratory issues.[6] Days over 97.6 degrees are expected to increase by 32 days by the end of the century and occur during a wider range of months from February to December with a 16 day increase by mid-century. This will impact grid reliability and cause possible power outages, increase water scarcity, and strain ambulance services. An increase in extreme heat days will impact vulnerable populations who will experience a higher frequency of public health risks such as dehydration, heat stroke, increased mortality rate, heart disease and increase in vector-borne diseases. Extreme heat is expected to also increase social adversities such as income loss especially outdoor workers who might be unable to access their workplace during extreme heat days.

UHI occurs in developed areas that experience hotter days and typically impact BIPOC communities and under-invested communities. Densely developed neighborhoods experience higher temperatures while greenspaces with vegetated areas more effectively absorb heat and stay cooler. Glendale will experience the most intense UHI effect in southwest neighborhoods along I-5 and the northeast neighborhoods along I-210. Glendale's most populated urban areas will likely experience the highest UHI effects. Heat inequity is the disproportionate distribution of heat-related hazards that impact socially vulnerable and BIPOC communities and will create compounding impacts on vulnerability due to existing problems around lack of access to green open spaces as a result of Glendale's history of redlining.

Compounding housing issues can exacerbate climate risks for vulnerable populations. The lack of affordable housing in Glendale increases overcrowding and contributes to susceptibility of heat-related illnesses for those in overcrowded housing. In addition, housing quality such as age and roof condition can impact health risks associated with extreme heat. For example, low quality housing such as poorly insulated homes can strain the electricity grid causing power outages and households may temporarily lose access to their air conditioning, fans, and refrigeration. This can lead to heat-related illnesses which can increase hospital visits

[5] "Reduce Urban Heat Island Effect." United States Environmental Protection Agency. January 22, 2024. https://epa.gov/green-infrastructure/reduce-urban-heat-island-effect#:~:text=%22Urban%20heat%20islands%22%20occur%20when,heat-related%20illness%20and%20mortality.

[6] Nature. Rapid increase in the risk of heat-related mortality. 2023. https://www.nature.com/articles/s41467-023-40599-x (accessed October 2024)

and fatalities. In Glendale, 58 percent of renter households spend 30 percent or more of their income on housing costs, compared to 55 percent regionally. Additionally, 36 percent of renter households in Glendale spend 50 percent or more of their income on housing cost, compared to 29 percent regionally.[7] These households are considered severely cost burdened and are therefore at a disproportionately higher risk towards climate change as they may likely not have access to air conditioning, insultation, and other infrastructural protections against climate hazards.

As a result, vulnerable communities in Glendale face higher heat-related public health risks as they may be under-resourced, have high outdoor exposure, face societal barriers, and/or have a chronic health condition. Extreme heat risks include heat stress, heat stroke, and dehydration, which can lead to death. Increased temperatures can also worsen asthma, cardiovascular disease, certain disabilities, and other respiratory and cardiovascular conditions leading to increased emergency room visits, hospitalizations, and fatalities.

Air quality degradation is expected to increase in Glendale due to climate driven increases in dust, smog, smoke, and decreases in natural filtrations. Increased temperature leads to dry, dusty conditions also associated with drought (Hall et al. 2018). Increases in dust conditions increase exposure to particulate matter, including **PM_{10}** (particulates less than 10 microns in diameter). PM_{10} can cause increased respiratory disease, lung damage, cancer, premature death, and reduced visibility. These adverse health effects have been reported primarily in infants and children, and seniors with preexisting heart or lung diseases.

Increases in ambient temperature can lead to higher rates of smog also referred to as **ozone (0_3)**. Groups most sensitive to O_3 include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors. Depending on the level of exposure, ozone can inflame and damage the airways; make the lungs more susceptible to infection; and aggravate lung diseases such as asthma, emphysema, and chronic bronchitis. Ground-level ozone increases with ambient temperatures and will be experienced at higher rates due to climate change leading to raised cardiovascular and respiratory morbidity and mortality rates. Ground-level ozone has also been shown to have particularly disproportionate adverse impacts on populations experiencing homelessness and lower median income.

Precipitation variability, fewer natural filtrations, and long periods of dry spells lead to less reliable air quality for the entire region. Urban vegetation can directly affect air quality, as large healthy trees remove more pollution than younger, smaller trees. Rising temperatures could increase mortality for large healthy trees which would lower the ability for urban vegetation to reduce air pollutants, therefore increasing pollutant exposure to vulnerable populations.

Temperature, severe wildfire conditions, and the area burned by wildfires have all increased throughout the state and are expected to continue to increase. Wildfire smoke is comprised of a mixture of hazardous air pollutants that are the principal threat to public health and are estimated to contribute to approximately 18 percent of the total $PM_{2.5}$ atmospheric emissions in the US. Short-term exposures to $PM_{2.5}$ (up to 24-hours duration) has been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants and children, and seniors with preexisting heart or lung diseases.

The populations most vulnerable to the impacts of poor quality are those who are under-resourced, individuals with high outdoor exposure, and individuals with chronic health conditions. The CCVA identifies high social vulnerability areas in Glendale located in north Glendale along I-210, and in south and southwest Glendale. These areas are considered vulnerable due to the higher presence of lower-income and working class residents. Vulnerable populations such as people facing homelessness, outdoor workers, and people with chronic health conditions are expected to be most vulnerable to the potential impacts of extreme heat. Populations that are under-resourced and do not have access to air filtration systems may experience respiratory issues leading to injuries or death. Individuals who face societal barriers, such as undocumented people, may not have access to medical services or evacuation centers. Outdoor workers, individuals using active transportation, and people experiencing homelessness may become injured from smoke inhalation and poor air quality. Projected annual average dry spell duration will increase to 144 days by the end of the century and 139 days by mid-century. This will result in vegetative stress, water scarcity, habitat loss, and strained water system which will consequently affect food security, air quality decline, respiratory illness, and

[7] Southern California Association of Governments (SCAG). Local Housing Data for the City of Glendale. 2021. https://scag.ca.gov/sites/main/files/file-attachments/glendale-he-0421.pdf?1620797773 (accessed October 2024)

more disease. Increased temperatures will reduce the water supply which will result in tree loss. Additionally, vulnerable populations such as those experiencing homelessness may have decreased access to water.

GOAL S-5 Climate Change

Goal 5. Reduce social and physical vulnerabilities resulting from the increasing risks of climate change

Policy 5-1: **Cooling Infrastructure.** Where feasible, install shade trees and cool pavement, expand the functionality and availability of cooling centers, and distribute low-cost cooling resources to reduce the impacts of extreme heat and poor air quality on climate vulnerable populations. (CAAP)

- Program 5-1.1 Explore incorporating strategies to reduce the urban heat island effect during City repaving projects. (CAAP)
- Program 5-1.2 Work to implement a tree planning program to prioritize planting trees in high social sensitivity census tracts with the lowest tree equity score, along safe routes to school and near bus stops, as detailed in the City's Community Forest Management Plan. (CAAP)
- Program 5-1.3 Where feasible, expand the functionality and availability of cooling centers to address a greater variety of needs as resilience centers facilitating health, food, medical, and emergency services during poor air quality events caused by climate hazards such as extreme heat events or wildfire. (CAAP)
- Program 5-1.4 Consider implementing a program to purchase and deploy a lending library of air purifiers and cooling devices in partnership with local community organizations and trusted community leaders, targeting high social sensitivity census tracts. (CAAP)

Policy 5-2: **Building Resilience.** Amend the building code to increase the resiliency of existing and new buildings so as to protect residents from the impacts of extreme heat and poor air quality. (CAAP)

- Program 5-2.1 Consider amending the building code to require CALGreen Tier 2 Voluntary Standards Section A5.106.11.2 for cool roofs and Section A5.106.7.2 for cool walls by the next California Building Codes (CBC) update cycle. (CAAP)
- Program 5-2.2 Amend the building code to require indoor cooling in new multi-family buildings, monitoring the California Department of Public Health guidance regarding indoor cooling which will inform the next CBC update cycle. (CAAP)
- Program 5-2.3 Consider amending the building code to require all newly installed HVAC units for existing buildings to have two-way air condition unit capability to provide heating and cooling by the next CBC update cycle. (CAAP)

Policy 5-3: **Access to Public Information.** Promote increased multi-lingual access to informational resources and emergency alert systems to raise awareness of and limit climate change impacts (CAAP)

- Program 5-3.1 Offer engaging year-round community events with educational resources at resilience centers, providing the community with free access to multi-lingual information, resources, and support to effectively prepare for and recover from poor air quality days, extreme weather events and other disasters, while making the resilience centers recognized fixtures in the community (CAAP).
- Program 5-3.2 Conduct emergency alert notifications in English, Spanish, Armenian, and Korean and distribute information about Emergency Alert Program (Everbridge) sign-up in areas of highest risk, including areas of high social sensitivity. The City shall remove procedural equity barriers from the sign-up program. (CAAP)

Program 5-3.3 Every five years, reassess which languages are spoken jointly by 5% or more of the Glendale community and expand emergency alert translations to additional languages as needed, consistent with Assembly Bill 1638. (CAAP; AB 1638)

Program 5-3.4 Provide online information for preparing homes and businesses for extreme weather events, such as resources on what to have at home in an emergency kit. (CAAP)

Policy 5-4 **Water Management.** Incorporate, where feasible, extended drought climate projections in water management planning and offer solutions to reduce water use and improve water quality through Glendale Water & Power while offering educational services to the community. (CAAP)

Program 5-4.1: Upon the next update to the Urban Water Management Plan (UWMP), review the historical record to identify the longest recorded drought and consider a similar drought length in the UWMP analysis. (CAAP)

Program 5-4.2 Where feasible, expand Glendale Water and Power programs to increase leakage detection systems and repairs; drought tolerant landscaping; low-flow fixtures, fitting, and appliances; greywater capture and reuse; leakage repairs; and financing and technical resources to subsidize costs to landlords and low-income households. (CAAP)

Program 5-4.3 Where feasible, implement a program to conduct an energy/water nexus study to inform the City's future public water rate structure and to directly assist low-income households with high utility burdens during water rate structure changes to avoid inequitable outcomes. (CAAP)

3.5 Hazardous Materials

3.5.1 OVERVIEW

The unhealthful effects of certain chemicals and substances have led to extensive regulation of hazardous materials. The United States Environmental Protection Agency (EPA) defines a **hazardous waste** as a substance that 1) may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; and 2) that poses a substantial present or potential future hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed. Hazardous waste is also ignitable, corrosive, or reactive (explosive) (U.S. EPA 40 CFR 260.10). A material may also be classified as a hazardous material if it contains defined amounts of toxic chemicals. The EPA has developed a list of specific hazardous wastes that are in the forms of solids, semi-solids, liquids, and gases.

The State of California defines **hazardous materials** as substances that are toxic, ignitable or flammable, reactive, and corrosive. The State also defines an **extremely hazardous material** as a substance that shows high acute or chronic toxicity, carcinogenicity (causes cancer), bioaccumulative properties (accumulates in the body's tissues), persistence in the environment, or is water reactive.

Hazardous materials are extensively regulated by Federal, State and City laws, and new regulations are constantly being developed as we learn more about the impact these substances have on human health and the environment. The three main sources of information on hazardous materials management as they pertain to the City of Glendale are: 1) the Environmental Protection Agency (EPA), 2) the California Environmental Protection Agency's (Cal EPA) Department of Toxic Substances Control (DTSC), and 3) the City of Glendale Fire Department.

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. To that end, the EPA requires that the levels of five major air pollutants be measured on a daily basis. These Air Quality Indexes are reported daily in the local news media serving metropolitan areas with populations exceeding 200,000. Air Quality Indexes are reported using a numerical value between 0 and 500 that corresponds to a health descriptor like "good" or "unhealthful." The local agency responsible for monitoring and enforcing air quality is the South Coast Air Quality Management District.

The EPA's National Primary Drinking Water Standard protects drinking water quality by limiting the levels of specific contaminants that are known to occur or have the potential to occur in water and can adversely affect

public health. The EPA and the State Water Resources Control Board set the Maximum Contaminant Levels (MCLs) for specific contaminants in ground water. These contaminants include organic and inorganic chemicals (minerals), substances that are known to cause cancer (carcinogens), radionuclides (such as uranium and radon), and microbial contaminants. Water purveyors are required to test their water for these contaminants on a fixed schedule, and report their results to the DHS.

Leaking underground storage tanks (UST's) have been recognized since the early 1980s as the primary cause of groundwater contamination by gasoline compounds and solvents. In California, regulations aimed at protecting against UST leaks have been in place since 1983.

California's program is more stringent than the Federal program, requiring that all tanks be double walled, and prohibiting gasoline delivery to non-compliant tanks. The State Water Resources Control Board (SWRCB) has been designated the lead regulatory agency in the development of UST regulations and policy. The SWRCB maintains an inventory of leaking underground storage tanks in a statewide database.

3.5.2 LOCAL CONDITIONS

There are 53 large-quantity and 348 small-quantity generators of hazardous materials in the City, as of October 2024. The distribution of these sites in the City is shown on Plate 5-1 of the Technical Background Report (Appendix A). There are also eight facilities listed in the Toxics Release Inventory that are known to have released hazardous materials of concern into the air – the EPA monitors these facilities closely to reduce the potential of future emissions at concentrations above the acceptable limits. Given these numbers, it is impressive that the actual number of unauthorized releases of hazardous materials into the environment is fairly small, as documented in the Federal and State databases reviewed. Of the 57 underground storage tank sites with a total of 141 active petroleum systems and 9 active hazardous substance systems, there have been no tank leaks since 2003.

Some of the significant hazardous sites are located within or adjacent to a liquefaction susceptible area, or in an unstable slope area, and two of the sites are located within or adjacent to a dam inundation area. None of the significant hazardous sites identified in the City are located in or adjacent to a high fire hazard area. Given that all of Glendale is susceptible to high to very high ground motions as a result of an earthquake on the Verdugo, Sierra Madre or Raymond fault, all hazardous materials sites should provide for, at a minimum, secondary containment of hazardous substances, including segregation of reactive chemicals, in accordance with the most recent California Fire Code and City of Glendale Fire Code amendments.

Some hazardous materials sites are located within 1/2-mile of schools. Significant Hazardous Materials sites should be required to prepare Risk Management Plans (RMPs) that identify the procedures by which the surrounding critical facilities will be evacuated, should it become necessary during an accidental release of hazardous materials. Alternatively, the schools in the immediate vicinity of the significant hazardous materials sites should consider implementing, as part of their School Safety Plans mandated by Senate Bill 187 (the Safe School Act of 1997), procedures for evacuation should a chemical spill occur in the area.

The City of Glendale's **Environmental Management Center (EMC)** is charged with the responsibility of conducting compliance inspections for facilities in the City that handle hazardous material, generate or treat a hazardous waste and/or operate an underground storage tank. All new installations of underground storage tanks require an inspection, along with the removal of the old tanks. The EMC coordinates hazardous material planning and appropriate response efforts with City departments, as well as local, and State agencies. The **Emergency Operating Center (EOC)** for Glendale is tasked with coordinating the City's disaster operations. The EOC is activated whenever there is a need to coordinate the emergency response of City departments, government agencies and volunteer groups in response to emergencies, disasters, or other significant events. It is activated upon order from the City Manager's office or by certain other designated City officials. The level of EOC staffing will vary with the specific emergency situation. Designated personnel report to the EOC through an activation paging system. The EOC is a secure facility where all City responders must check in with appropriate credentials in order to receive EOC identification. The goal of these agencies is to improve public and private sector readiness, and to mitigate local impacts resulting from natural or technological emergencies. Both the EMC and EOC are part of the Glendale Fire Department that deal with the planning for and response to the natural and technological disasters in the City of Glendale. The EMC is also tasked with administering a household hazardous waste collection plan for the City of Glendale in accordance with the California Integrated Solid Waste Management Act of 1989 (AB 939). The EMC is located at 780 Flower Street.

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GOAL S-6 Hazardous Materials

Goal 56. Reduce threats to the public health and safety, and to the environment, from hazardous materials.

Policy 6-1: **Limiting exposure of hazardous materials and waste.** The City shall strive to reduce the potential for residents, workers, and visitors to Glendale to being exposed to hazardous materials and wastes.

Program 6-1.1: The City shall enforce the California Environmental Protection Agency's seven Unified Program elements including the disclosure laws that require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use or transport, and to notify the appropriate City, County, State and Federal agencies in the event of a violation.

Program 6-1.2: The City shall identify City roadways along which hazardous materials are routinely transported. If critical facilities, such as schools, hospitals, child care centers or other facilities with special evacuation needs are located along these routes, the City shall notify the operators of these facilities that they are near such routes. The City shall work with the operators of these facilities to assist them with the preparation of evacuation plans.

Program 6-1.3: The City shall evaluate the potential impacts related to hazardous materials during the environmental review process for new buildings or businesses where the production, use, storage, transport, or disposal of hazardous materials is proposed. Potential impacts shall be fully mitigated.

Policy 6-1.4: **Incident response.** The City shall maintain the capability of responding to hazardous materials incidents in the City and along the sections of freeways that extend across the City. This includes maintaining cooperation agreements with adjacent jurisdictions and continuing to coordinate with regional providers of emergency services.

Policy 6-1.5: **Reduction or elimination of hazardous materials.** The City shall encourage residents and businesses to reduce or eliminate the use of hazardous materials. This includes encouraging residents to buy toxic substances in only the amount needed to do the job, or better yet, to use safer non-toxic alternate products that do not pose a threat to the environment.

Program 6-1.6: The City shall support the operation of recycling centers that take hazardous substances, such as paint, paint thinner, used waste oil, etc.

Program 6-1.7: The City shall review the future direction of the City's Certified Unified Program Agency (provided by the City's Fire Department) to determine the best use of the agency's resources (including but not limited to review of existing and proposed facilities, monitoring trends in the use of types and quantities of hazardous materials, enforcing cleanup and mitigation measures, and public education efforts).

Program 6-1.8: The City shall coordinate hazardous materials regulation with other agencies. The Los Angeles County Hazardous Waste Management Plan is incorporated herein by reference and shall be used by the City as a guide to hazardous waste management efforts.

3.6 Terrorism, Civil Disturbance and Crime

3.6.1 OVERVIEW

Terrorism is defined as the "use of force or threats to demoralize, intimidate, and subjugate, especially as a political weapon or policy." Terrorists often use or threaten to use nuclear, biological, or chemical substances to cause as much damage as possible in an area or to a group of people. These are referred to as **Weapons of Mass Destruction (WMDs)**.

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Terrorism remains a serious threat to government operations, community members, and critical infrastructure. Since the early 1990s, the Federal and State governments have established programs and protocol aimed at planning for and dealing with terrorist acts. In 2004, the State of California created the **California State Threat Assessment System (CAL STAS)** as an integral component of the State's Homeland Security Strategy to identify, track, assess, and analyze homeland security threats. The STAS is a collaborative effort between federal, state, local, and tribal public safety agencies to share resources, expertise, and information to detect criminal and terrorist activity. The STAS produces and disseminates timely and actionable threat information for government leaders and policymakers, private sector partners, and the broader public safety and national intelligence communities to support decisions, properly allocate resources, and mitigate threats.

Civil disturbances typically develop in response to an unpopular policy or act issued or made by the group in power, either the policy makers, or those that enforce these procedures, such as the police. Civil disturbances can also develop in response to perceived or real racial or social inequality, and deep-seated political or religious differences. Civil disturbances can include minor infractions, such as disturbing the peace or assembling illegally, to major offenses such as looting, robbery and possession of stolen property, assault, arson, brandishing of weapons, and even murder. These incidents are generally handled at the local level, with assistance from adjacent jurisdictions as needed. In the event of a large-scale mass demonstration, rioting or other violent acts, the National Guard may mobilize to aid the local law-enforcement agencies.

3.6.2 LOCAL CONDITIONS

The risk of terrorist attacks occurring in Glendale is considered low but not impossible since California can be considered an attractive terrorist target, and therefore, by association, Glendale can be considered at risk. The Police Department maintains a confidential list of assets in the City that are considered potential terrorist and/or civil disturbance targets, and is vigilant about any unusual or suspicious activities in and around these areas.

The Fire and Police Departments are responsible for responding to terrorist attacks and civil disturbances. The Police Department has several programs specifically designed to deal with crowd control issues, and terrorist activities. Several other regional and State organizations and programs are responsible for planning for and responding to civil unrest and terrorist activities. The City of Glendale is one of the few communities in the area to receive specialized training and equipment to respond to terrorism, including incidents involving WMDs. Glendale has incorporated terrorism scenarios into the City's Emergency Response Plan and into training exercises.

The City of Glendale has one of the lowest crime rates for cities with populations exceeding 100,000. The Police Department indicates that property crimes in Glendale far outnumber crimes against persons. The data also show that as in other commerce centers, white-collar crimes, such as fraud and identity theft, have increased in the last few years in Glendale. Like many diverse communities, Glendale experiences a presence of culturally based organized crime. Changes in the frequency, pattern, or type of crime are addressed by the Police Department. For example, the street-gang situation in Glendale is addressed on a daily basis, primarily by the Special Enforcement Detail. The Police Department utilizes a variety of programs and affirmative policing, forming partnerships with community groups, businesses, schools, and other government agencies, to fight crime. The community as a whole has a zero tolerance for criminal activity.

GOAL S-7 Terrorism, Civil Disturbance, and Crime

Goal 7. Increase the City's capability to effectively respond to acts of terrorism or civil disturbance, and to reduce criminal activity.

Policy 7-1: **Response to terrorist and civil disturbances.** The City shall develop and implement programs intended to save lives, prevent injury, and reduce property damage during and following a terrorist attack or civil unrest incident.

Program 7-1.1: The City shall regularly review and update as necessary the confidential list of potential terrorist targets in the City.

Program 7-1.2: The City shall study ways to minimize collateral damage in the areas surrounding the confidential list of potential targets.

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Program 7-1.3: The City shall study potential access problems along major routes such as Brand Boulevard, San Fernando Road and Verdugo Boulevard in the event of an attack or civil unrest, and shall provide recommendations to manage traffic through these areas in the event of a disaster.

Program 7-1.4: The City shall identify potential, strategically located staging sites near high-risk assets from which emergency response personnel, including mutual aid forces, can be deployed quickly and efficiently.

Program 7-1.5: The City shall continue to conduct emergency response exercises that utilize credible crime, terrorism, and natural disaster scenarios.

Program 7-1.6: The City shall continue to prepare and implement measures to protect essential City facilities and infrastructure from criminal or terrorist attack, including cyber attack.

Program 7-1.7: The City shall regularly review the Police Department's level of training and contingency plans to ensure that the Department is responsive to any changes in the City's profile (such as changes in demographics or types of businesses) that may increase the risk of terrorist attacks.

Program 7-1.8: The City shall annually review plans to respond to a large-scale criminal event, such as a terrorist incident. Such plans shall consider topics such as identification of potential targets, risk reduction strategies, minimization of collateral damage and coordination with other agencies.

Policy 7-2: **Crime reduction programs.** The City shall undertake programs aimed specifically at reducing crime.

Program 7-2.1: The City shall continue to monitor and regularly study crime statistics to look for trends or shifts in population, economics or social conditions that would engender increased crime.

Program 7-2.2: The City shall continue to educate the public about crime watch, neighborhood watch and other similar programs.

3.7 Dangerous Animals and Plants

3.7.1 OVERVIEW

Wild animal – human interaction appears to be increasing in California, in part as a result of people's increased encroachment onto the progressively smaller "islands" of undeveloped terrain left in the region. This also means that animal density in these undeveloped areas has increased, with the resultant increased competition for food resources. Most often, this interaction consists of casual sightings of animals from a distance, but some animals have actually adapted to their urban surroundings and become accustomed to eating pet food, trash, and even pets. Some animals are carriers of disease.

There are several plants that can be poisonous if touched or eaten. While this is not a major health concern, sensitive individuals, especially infants, need to be protected from the potential harmful effects. There are innumerable lists of poisonous plants available in books and on the web. It is difficult to address all potential dangerous plants, but some of the more common ones are listed in the accompanying Technical Background Report (Appendix A).

3.7.2 LOCAL CONDITIONS

Coyotes are common in the Glendale area. Studies of these coyotes show that they have adapted well to the urban environment partly because people are used to leaving food out for them. The San Gabriel Mountains are habitat for mountain lions and black bears. These animals tend to avoid humans, although bears are also opportunistic and have learned to look for food in dumpsters and other areas frequented by people. Actions that people can take if they encounter a mountain lion or black bear are similar: make yourself look as big as possible; shout; throw rocks or sticks you can reach without bending over; take aggressive action.

Deer and smaller animals like raccoons, ground squirrels, rabbits, bats, and rats can carry diseases that can be transmitted to domestic animals and people, either through direct contact, or through the bites of fleas

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and ticks. Some of these conditions include rabies (through direct contact, such as a bite, from the infected animal), and plague (carried by infected fleas that live on squirrels, rats, rabbits, and even domestic animals). Mice and other rodents can also carry the virus that causes hantavirus pulmonary syndrome, a flu-like condition that can cause pulmonary distress in some individuals. Mosquitoes are also the carriers of viruses that can cause encephalitis or meningitis, such as West Nile encephalitis. People affected by all of these conditions have been reported in California , although these are generally isolated cases. The Centers for Disease Prevention and Control keep track of outbreaks or incidents of these diseases throughout the United States and provide detailed information about each of these conditions at their web page.

Other potentially dangerous animals in the area include rattlesnakes, bees and wasps, and black widow spiders. Los Angeles County, including Glendale, is on the watch list for Africanized Honey Bee (AHB) infestation, although it is not considered a serious threat at this time. Several Salmonella incidences linked to reptiles, such as iguanas and turtles, have been reported in Los Angeles County.

The City of Glendale contracts with the Pasadena Humane Society (PHS) for animal control. The Glendale Police Department administers the contract. PHS provides to citizens, at nominal fees, humane traps that can be used to trap small animals. The PHS also deals with feral cats and stray dogs. The Arcadia District Office of the County of Los Angeles Agricultural Commissioner / Weights and Measures Department and the Greater Los Angeles County Vector Control District provide vector control services for Glendale (a **vector** is an organism that serves as carrier from one host to another of disease-producing bacteria, fungi, worms, or viruses).

GOAL S-8 Dangerous Animals and Plants

Goal 8. Reduce the risks to the public related to wild animals and poisonous or dangerous plants.

Policy 8-1: **Public Information.** The City shall provide information to the public about the risks associated with wild animals and dangerous or poisonous plants.

Program 8-1.1: The City shall make information available to the public (for example, with pamphlets or using the City's web site) summarizing the ways to avoid dangerous wild animals and actions that can be taken in the event of an encounter with such animals.

Program 8-1.2: The City shall make information available to the public, such as pamphlets or information on the City's web site, summarizing the ways to avoid dangerous plants and first-aid measures that can be taken in the event of exposure to or ingestion of such plants.

Policy 8-2: **Prevention of Dangerous Wildlife Interaction.** The City shall assist the public in their efforts to reduce interactions with wild animals and dangerous or poisonous plants.

Program 8-2.1: The City, at the discretion of the Director of Public Works, shall provide residents with trash receptacles that are difficult for animals to knock over or open.

Program 8-2.2: The City shall work with the Park Rangers to monitor sightings of mountain lions and black bears in and adjacent to City limits, and shall post this information at the entrance to trailheads in the areas where sightings have been made in the past year.

Program 8-2.3: The City shall encourage residents who wish to compost in their properties to use enclosed composting bins as part of the City's edible food recovery program and organics procurement program required by SB 1383. (CAAP)

Program 8-2.4: The City shall encourage residents to have their pets vaccinated for rabies and provide information about the benefits of flea control as a method for preventing the spread of dangerous diseases.

Program 8-2.5: The City shall monitor for unusual numbers of dead rodents or birds and notify appropriate County agencies if such an event occurs.

Program 8-2.6: The City shall monitor for coyote sightings and work with appropriate agencies to eliminate or relocate aggressive coyotes as necessary.

3.8 Disaster Preparedness, Recovery and Emergency Response

3.8.1 OVERVIEW

Planning issues pertaining to emergency response, disaster preparedness, and disaster recovery require an assessment of the hazards, identification of functions and resources to handle short-term response, and development of recovery procedures. Earthquakes pose the greatest challenge because they occur with little or no warning, and can set into motion a number of linked events. In the immediate aftermath of a major earthquake, numerous decisions need to be made. These decisions include the orderly evacuation and sheltering of displaced individuals and families, the search for and rescue of victims, and the suspension and resumption of critical services such as utilities and transportation routes. Effective emergency response hinges on an accurate assessment of the disaster to identify those areas that need the most assistance, and reliance on pre-determined strategies that allow emergency personnel to make the best possible decisions given the circumstances.

Evacuation routes are used to guide residents and visitors from dangerous areas to safer locations or to transport emergency responders. Evacuation routes and bomb shelters are a legacy of the 1950s and 1960s when communities prepared for the evacuation of their entire population if necessary as a result of a nuclear war. In the last two decades, however, there has been a shift toward sustainability, with communities emphasizing the need to be self-sufficient after an emergency. There are, nevertheless, certain types of disasters that require the mobilization (evacuation) of a segment of the population from a hazardous or

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potentially hazardous area to a safer area. This would be the case, for example in the event of a wildfire threatening residences at the urban-wildland interface, the inundation of the area directly down gradient from a breached dam, or the area downwind from a facility that releases a toxic chemical into the air. All of these events require the immediate evacuation of high occupancy and dependent facilities (immobile populations) to safer areas that may or may not be near to the impacted area. Evacuated individuals may be able to come back home or to their place of business within 24 to 48 hours of the disaster. In the event of an earthquake, displaced individuals or households generally prefer to take shelter in a facility or park as close to home as possible. Evacuation need not be immediate following the earthquake, but the length of time that displaced people may need to remain in emergency shelters can be expected to last several days, until they can return home or find more permanent locations with relatives, friends or elsewhere.

Disaster response routes are roads that can best move emergency services and supplies to where they are needed the most immediately following a major disaster. Therefore, disaster routes should be kept clear of non-essential traffic and debris following an earthquake or another disaster. The public needs to stay off disaster response routes until allowed to travel on them by the local police.

In our commitment to ensuring the safety and well-being of all residents, the city will continue to foster its collaborative approach among police, fire, and city departments to effectively prevent, mitigate and recover from disasters necessitating emergency evacuations. Special attention will be given to areas with unique needs and concerns, ensuring that vulnerable populations receive tailored support and resources during such events. By enhancing communication, planning, and training, we aim to create a resilient community capable of responding swiftly and effectively to emergencies, safeguarding the lives of all citizens.

3.8.2 LOCAL CONDITIONS

The data suggest that the City of Glendale is at risk of experiencing a near-source earthquake given its proximity to three active seismic sources. The City has already taken several actions that have reduced its vulnerability to earthquake-induced strong ground shaking, but additional work can be done. The City's Emergency Plan establishes the responsibilities of the City's emergency response personnel and the framework by which the City will respond to and receive emergency mutual aid from other local governments and County, State and Federal agencies. The Emergency Plan is updated annually and City personnel train with it annually in exercises ranging from tabletop discussions to full-scale exercises involving dozens of personnel in the field supported by the activation of the City's Emergency Operations Center.

It is important to remember that during large-scale disasters, such as an earthquake, several emergencies may have to be addressed simultaneously, and that emergency resources from neighboring communities and jurisdictions may not be available for some time after the disaster. In fact, other neighboring cities may fare worse than Glendale to the same disaster, and Glendale may have to respond to incidents not only within its corporate boundaries, but may be called on to assist other nearby communities. Self-sufficiency, both by City Divisions and the residents, is an important component of a community's preparedness.

Plate P-5 Emergency Response Route shows the emergency response routes through the City of Glendale. These emergency response routes are the main thoroughfares through the City to be used by emergency response services during an emergency. If the situation warrants the evacuation of an area, these roadways serve as evacuation routes. Plate P-5 also shows disaster response routes. There are significant differences between evacuation routes and disaster routes that need to be understood by everybody.

Evacuation routes are used to relocate residents and visitors from a hazardous or potentially hazardous area to a safer area. Given that evacuation activities are controlled by particular situations, selection of the most appropriate evacuation route for a particular disaster generally requires some improvisation. Nevertheless, identifying the routes through the City that provide for the most direct access in and out of a given area helps to speed the process during an actual emergency. Road blockage of the evacuation and disaster routes should be prevented at all times.

Disaster routes serve as thoroughfares primarily for the movement of emergency response vehicles and access to critical facilities. Disaster routes are identified in Figure 12.6 of the 2022 County of Los Angeles Safety Element.[8] These are typically wide roads or major arterial routes that allow for cross-town traffic. Notice that all fire stations in the City are located along or immediately adjacent to one of these disaster

[8] County of Los Angeles. 2022. Safety Element. https://planning.lacounty.gov/long-range-planning/general-plan/general-plan-elements/

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response routes. Immediate emergency clearance (for example of debris associated with an earthquake) and road/bridge repairs for short-term emergency operations are emphasized along disaster routes. When these roadways are being used for disaster response, the general public needs to stay off these roads until told otherwise by the Police Department or the EOC. Specific actions warranted along these disaster response and evacuation routes include the following:

Mitigation measures that prevent earthquake-induced slope failures from blocking these roads should be implemented. This is especially significant for Glenoaks Boulevard, since it provides the only source of access in and out for this area of Glendale, and to a lesser degree for East Chevy Chase Drive, both in the San Rafael Hills.

Improvement of those disaster response routes with inadequate widths to support the mobilization of fire engines and other emergency response vehicles.

Mitigation and/or setback of structures or buildings that could potentially block the public right-of-way along these routes, where feasible. This includes cornices, parapets, or other overhangs that if collapsed, would impact traffic on these roads.

Development of specific plans for traffic control contingencies during major disasters, considering both evacuation and disaster response options.

The disaster routes identified divide the City into sections. Potential shelter locations have been identified within each of these sections. These shelter locations are shown on Plate P-3 and on Table 2. Residents and visitors in need of shelter following a disaster are encouraged to report first to the shelter closest to them. If that shelter is full, closed, or otherwise unavailable, then residents would be referred to the next closest open shelter. These facilities are to serve as staging and communication areas for emergency response personnel, and City officials and relief organizations managing the emergency recovery efforts. Residents should be aware of the disaster routes and emergency shelters in their neighborhood, and the actions to take in the event of a disaster, including how to be self-sufficient for at least 72 hours after a disaster. Equipment caches with supplies can be maintained at several of the shelter locations identified in Table 2 so that they are immediately available during an emergency.

Plate P-5 and LCI's technical advisory document on Fire Hazard Planning mandates that cities and counties must identify and consider residential developments with less than two evacuation routes located in any hazard zone in the Safety Element. Single access points of entry and exit were identified for Glendale in compliance with SB 99 and LCI's requirements (see Plate P-5 Emergency Response Route). This analysis took a conservative approach and assessed all Glendale residential developments for single access entry and exit points, as most of the City is in at least one of four hazard risk zones: seismic, flood, fire, and landslides.

The process to identify the residential developments that have less than two routes that can be used for emergency evacuation in Glendale included:

1. Identifying residential neighborhoods based on residential land use designations consistent with the Glendale General Plan Land Use Designations Map.
2. Road classifications (local street, major arterial, minor arterial, urban collectors, freeway, and other) were used to identify areas where 30 or more parcels/units had a single entry/exit point within high, medium high, medium, moderate, and low residential zoning as well as mixed use and additional residential zoning (residential open space and restricted residential).
3. The number of assessor parcel number boundaries adjacent to a marked road were counted. In low density residential land use areas with single family homes, the number of parcels with driveway access to the street were counted and included as a single entry/exit neighborhood if there were 30 or more units serviced by the local road. The 30 or more units threshold is consistent with the California Public Resources Code Section 4290.5 which defines subdivision as an existing residential development of more than 30 dwelling units. Medium and high-density land use areas were evaluated using the same methodology of 30 or more dwelling units.

Plate P-5 Emergency Response Route map identifies multiple residential developments in Glendale with a single access point of entry/exit. There are single access neighborhoods located throughout Glendale, including in the Chevy Chase mountains, Verdugo Mountains, and near Deukmejian Wilderness Park. The Chevy Chase and Verdugo Mountain areas are within Very High Fire Hazard Severity Zones with existing

evacuation plans as determined by the City. Single access points, particularly in Fire Hazard Severity Zones, can make emergency evacuations problematic during an emergency, such as a wildfire. Plate P-5 Emergency Response Route map also illustrates the major evacuation routes within Glendale.

Consistent with AB 747 and Government Code 65302.15(a), the City prepared an **evacuation analysis** (Appendix C) that considers two representative evacuation scenarios and provides the City with estimates of roadway capacity constraints and travel time considerations during evacuations. The analysis helps identify locations where there is a greater potential for traffic congestion and need for additional control measures in the event of an evacuation. The evacuation analysis considers the following two representative evacuation scenarios:

- **Wildfire (Scenario #1)** - Wildfire ignites in the Verdugo Mountains/San Rafael Hills in east Glendale
- **Landslide (Scenario #2)** – Landslide occurs in the San Gabriel Mountains in north Glendale

The evacuation analysis uses the City of Glendale Travel Demand Model ("travel model"). The current travel model was calibrated and validated for a 2021 base year and includes a 2040 future scenario with 2040 land use forecasts and transportation improvement assumptions. The travel model represents all land uses in the City grouped into transportation analysis zones. The areas that would be affected by each evacuation scenario were identified based on the CAL FIRE's Fire Hazard Severity Zones mapping and City of Glendale staff and emergency responders. The affected areas were overlaid with the Glendale transportation analysis zones to identify the number of people that would need to be evacuated under each evacuation scenario. Transportation activity was modeled for one worst-case time period, based on the weekday PM peak hour (between 4PM to 6PM) when non-evacuation traffic and congestion would be at its highest levels. This analysis was developed based on conservative assumptions and modeling techniques that reflect current understanding of evacuation analysis.

A summary of the results of this analysis is provided below.

Wildfire (Scenario #1)

- **Base Year:** If an evacuation were to occur due to a wildfire in the Verdugo Mountains, the analysis estimates over-capacity conditions on several roadways in the City. Specifically, the roadways where demand volumes are projected to be at or exceed road capacity with the City of Glendale can be found in Appendix C, Figure 6.
- **Future Year:** With peak evacuation from a wildfire in the Verdugo Mountains in the future year, the analysis predicts over-capacity conditions on several roadways in the City. In addition to the locations listed for the base year, the roadways where demand volumes are projected to be at or exceed road capacity with the City of Glendale can be found in Appendix C, Figure 7.

Landslide (Scenario #2)

- **Base Year:** With peak evacuation from a landslide in the San Gabriel Mountains in north Glendale in the base year, the analysis indicates over-capacity conditions on several roadways in the City. Specifically, the roadways where demand volumes are projected to be at or exceed road capacity within the City of Glendale can be found in Appendix C, Figure 9.
- **Future Year:** With peak evacuation from a landslide in the San Gabriel Mountains in north Glendale in the future year, the analysis predicts over-capacity conditions on several roadways in the City. Most congestion locations would be the same as those identified for the base year. In addition to the locations listed for the base year, the roadways where demand volumes are projected to be at or exceed road capacity within the City of Glendale can be found in Appendix C, Figure 10.

Reference Appendix C for more information on the methodology and assumptions used for the evacuation analysis and more detailed results.

GOAL S-9 Disaster Preparedness, Recovery and Emergency Response

Goal 9. Maintain a high level of emergency preparedness.

Policy 9-1: **Emergency Response.** The City shall prepare for emergency response and recovery from natural and urban disasters, especially wildfires and earthquake hazards.

Program 9-1.1: The City shall update disaster preparedness and recovery plans as necessary, including the Glendale Emergency Plan with every update to the Local Hazard Mitigation Plan to evaluate evacuation route capacity, safety, and viability under a range of emergency scenarios. (AB 747). Such plans shall be prepared in accordance with regional, State and Federal regulations and guidelines.

Program 9-1.2: The City shall maintain and update the City's emergency response organizations consisting of representatives from all City departments, local quasi-governmental agencies, private businesses, citizens, and other community partners involved in critical and/or community-wide services.

Program 9-1.3: The City shall maintain mutual aid agreements with other agencies and develop partnerships with other emergency relief organizations.

Program 9-1.4: The City shall establish traffic control contingency plans for disaster routes.

Program 9-1.5: The City shall make information available to the public (for example, with pamphlets or using the City's web site) about steps they can take to increase their level of disaster preparedness such as the need for storing supplies to increase self-reliance in the aftermath of a disaster.

Program 9-1.6: The City shall promote the development of evacuation plans in high-rise buildings, immobile population centers, businesses that use hazardous substances, and in other critical facilities. The evacuation procedures should be designed to be carried out without aid from the City's emergency response resources. Ensure that new development has sufficient fire protection, police, and emergency medical services available by reviewing development proposals to determine impacts on emergency services and ensure developments meet appropriate safety standards.

Program 9-1.7: The City shall compile and maintain information about facilities with special risks, hazards and needs that may require specialized response.

Program 9-1.8: The City shall participate in emergency preparedness exercises.

Program 9-1.9: The City shall inventory equipment available, including battery-powered and mobile generators, cranes, bulldozers, concrete saws, large ladders, personal protective gear (including respirators, gloves, and protective clothing), medical equipment and supplies, tents and other facilities that can be used for temporary shelter and as makeshift emergency medical centers.

Program 9-1.10 The City shall assess existing City buildings, including those for first responders and critical service providers, to determine retrofits needed for long-term resilience to climate change-affected hazards including wildfires. (CAAP)

Program 9-1.11 The City shall provide accurate documentation required for cost recovery efforts from federal, state, and other agencies in the event of a disaster or emergency. This includes providing a plan for rapid resumption of impacted businesses and community services. (CAL FIRE)

Policy 9-2: **Plan Updates.** The City shall review and update as necessary the Glendale Emergency Plan with every update to the Local Hazard Mitigation Plan to evaluate evacuation route capacity, safety, and viability under a range of emergency scenarios. (AB 747)

Policy 9-3: **Evacuation Communications**. The City shall strengthen and maintain evacuation communication protocols among local agencies and organizations involved in the

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management of emergency response, and the communication between the City and the general public during an emergency.

Program 9-3.1: The City shall implement the communications-related strategies identified in the Evacuation Analysis (Appendix C) to address how information may be shared in preparation for, during and after emergency events. Such strategies include:

- This City shall consider using systems such as the public information emergency systems and emergency satellite communications to improve communications, such as those outlined in the FEMA NIMS Guidance for Public Information Officers. (AB 747)
- The City shall use variable message board equipment and targeted installation of permanent dynamic message signs on evacuation routes to improve communication and reduce public confusion. (AB 747)
- The City shall implement a traffic control center which would have up to the minute reports on traffic patterns and can communicate directly with emergency officers via broadcast media, social media, and other emergency communications channels (e.g., Everbridge, Genesis) to let drivers know about roadway congestion and conditions and direct them to alternate routes. (AB 747)
- The City shall consider installing new traffic counters and/or CCTV cameras on freeways, which can further help assess traffic flow, volume of vehicles evacuating, and monitor incidents during emergency evacuation events. Caltrans currently has two cameras in the proximity of Glendale: SR-2 at Colorado Street and SR-134 at Glendale Avenue. (AB 747)
- The City shall post signs and flyers in public places, such as businesses, community centers, and parks, with instructions on where to go in an evacuation and key evacuation information. Signs and flyers should be posted in multiple languages. (AB 747)

Program 9-3.2 The City shall increase redundancy in emergency evacuation communication systems in the event of an electric outage through a variety of measures, including back-up power for telecommunication towers and other critical facilities, distributing information via radio channels, promoting ownership of hand cranked radios, and other means. Regularly test alert systems for potential evacuation scenarios. (Attorney General Wildfire Guidance)

Policy 9-4: **Vulnerable Populations.** The City shall implement additional steps and resources for the successful evacuation of vulnerable populations, including those who are visually impaired, hearing impaired, mobility impaired, people without vehicles, non-English speaking persons, people with medical conditions, and unhoused populations. (AB 747)

Program 9-4.1: The City shall implement the strategies identified in the Evacuation Analysis (Appendix C) for evacuation of vulnerable populations. Such strategies include:

- The City shall ensure that evacuation information is provided for the hearing impaired that may include additional visual aids such as pictures or maps, and signage with larger fonts, as well as written updates via communication and social media channels. (AB 747)
- The City shall partner with neighboring cities/private/non-profit agencies to provide adequate paratransit services for those who need assistance in an evacuation, especially for those visually and mobility impaired. (AB 747)
- The City shall emphasize the importance of carpooling with neighbors or community members and provide information on transit routes and transit stops, especially to those individuals without vehicles. The City shall also identify areas that would benefit from a carpooling program (e.g., communities with limited ingress/egress) and coordinate with neighbors, local businesses,

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and local transit to identify volunteers for carpooling and vehicle sharing at the community level. (AB 747)

- The City shall provide bilingual or multilingual materials to support communication with non-English speaking populations during evacuation. Communications should be created in English, Armenian, Spanish, Tagalog, and Korean. (AB 747)
- The City shall communicate in advance the location and availability of hospitals or facilities with emergency/life-sustaining medical equipment that residents, especially those with medical conditions, can go to during an evacuation and identify the transportation mode of transfers to other facilities, based on the criticality of patients/clients and type of health needs. (AB 747)
- The City shall arrange for food, shelter, and transportation for unhoused populations, offering age-appropriate emergency and evacuation information to homeless children. (AB 747)

Policy 9.5 **Traffic Management.** In the event of an emergency requiring evacuation, traffic management strategies to increase evacuation capacity and efficiency shall be implemented (AB 747):

Program 9-5.1: The City shall implement the roadway and intersection capacity and resilience related strategies identified in the Evacuation Analysis (Appendix C) to maximize the capacity of the evacuation roadway network. Such strategies include:

- Establish temporary control points to temporarily close inbound travel lanes on select unlimited access arterials (such as parkways and boulevards) to allow outbound traffic to utilize these lanes during evacuation. (AB 747)
- Establish temporary control points to close inbound lanes on selected roadways utilized for evacuation routes to prevent drivers on these routes from entering the City while evacuation is underway. (AB 747)
- Install signal battery backups in case signal operations need to be maintained during a power outage. Consider using channeling devices, static signs, and coning strategies to manage intersection flow during power outage if the signals lack power. (AB 747)
- Identify and communicate with communities that have one or two access points. Prioritize adding additional access to communities which are currently served by only one or two access points. (AB 747)
- Develop transportation solutions such as the use of a bus system for evacuating individuals with special needs (such as those with mobility limitations). (AB 747)
- Establish traffic control points (i.e., locations along designated evacuation routes with emergency management personnel) to maintain a greater degree of evacuation management. These locations could enhance the efficiency of an evacuation, reduce public confusion, and allow increased operational flexibility during an evacuation. (AB 747)
- Maintain evacuation roadways and shoulders to clear them of trees, vegetation, and debris that would block travel lanes and shoulders for evacuating and emergency operation vehicles. (AB 747)

Program 9-5.2 **Single Access Neighborhoods.** The City shall implement strategies to improve emergency access for Glendale's single access neighborhoods (CAL FIRE, SB 99, Attorney General Wildfire Guidance). Such strategies shall include:

- The City shall identify alternative plans for evacuation depending upon the location and dynamics of the emergency and consider conducting traffic modeling to quantify travel times under various likely scenarios. Consider

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the adequacy of emergency access under a range of emergency scenarios, including proximity to existing fire services and the capacity of existing services. (CAL FIRE, SB 99)

- The City shall encourage residents to take only one or two vehicles (based on household size) to reduce the number of evacuating vehicles. The City shall offer offsite parking facilities to safely store secondary vehicles in advance of an emergency event. (CAL FIRE, SB 99)
- The City shall implement early evacuations under high-risk conditions for vulnerable communities with limited egress routes, including single-access neighborhoods. (CAL FIRE, SB 99)
- The City shall conduct regular evacuation trainings to educate residents on how to prepare to be without electricity for three days or more and how to shut off domestic gas supply in cases of emergency including training for single-access community homeowner associations and residents. (CAL FIRE, SB 99)

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EXHIBITS

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Table-1 Hazard Assessment of Critical Facilities and Schools in Glendale

(based on their location relative to hazards described in Appendix A: Technical Background Report only--Site Specific Studies Recommended)

ID	Critical Facilities	Strong Shaking[1]	Surface Rupture	Liquefaction	Landsliding	Slope Instability	Wildfire Susceptibility	Flooding	Dam Inundation	Hazardous Listings
1	Emergency Operations Center									
2	Glendale Police Station									
3	LA County Sheriff Station									
Fire Stations										
4	Fire Station 21									
5	Fire Station 22									
6	Fire Station 23									
7	Fire Station 24									
8	Fire Station 25									
9	Fire Station 26									
10	Fire Station 27									
11	Fire Station 28									
12	Fire Station 29									
Hospitals										
13	Verdugo Hills Hospital									
14	Adventist Medical Center									
15	Glendale Memorial Hospital									
Schools										
16	Glendale Community College									
17	Montrose Campus of Glendale College									
18	R.D. White Elementary									
19	John Marshall Elementary									
20	John Muir Elementary									
21	Horace Mann Elementary									
22	Thomas Edison Elementary									
23	Columbus Elementary									
24	Mark Keppel Elementary									
25	Thomas Jefferson Elementary									
26	Balboa Elementary									
27	Hoover High School									
28	Eleanor Toll Middle School									
29	Benjamin Franklin Elementary									
30	Allan F. Daily High School									
31	Theodore Roosevelt Middle School									
32	Glendale High School	H								
33	Woodrow Wilson Middle School									
34	Glenoaks Elementary									
35	Verdugo Woodlands Elementary									
36	John Fremont Elementary									
37	Lincoln Elementary									

ID	Critical Facilities	Strong Shaking[1]	Surface Rupture	Liquefaction	Landsliding	Slope Instability	Wildfire Susceptibility	Flooding	Dam Inundation	Hazardous Listings
38	Dunsmore Elementary	H								
39	Clark Magnet High School	H								
40	Cerritos Elementary									
41	Valley View Elementary									
42	Glendale Career College									
43	La Crescenta Elementary									
44	Monte Vista Elementary									
45	Mountain Avenue Elementary									
46	Rosemont Avenue Middle School									
47	Crescenta Valley High School									

	High Risk to Critical Facility--facility is located in, or within ½ mile, of a census tract containing 31 or more hazardous waste listings.
	Moderate Risk to Critical Facility--facility is located in, or within ½ mile, of a census tract containing 11 to 30 hazardous waste listings.

[1] The entire Glendale area can experience strong seismic shaking as a result of an earthquake on the Sierra Madre, Verdugo, Raymond or Hollywood faults. Based on the HAZUS analyses, Glendale High School is anticipated to experience at least moderate damage as a result of any of the four earthquake scenarios mentioned above. The schools in the northern portion of the district, near the Sierra Madre fault, are also anticipated to suffer at least moderate damage as a result of the maximum magnitude earthquake on the Sierra Madre fault. The schools that, according to the HAZUS analyses, are more likely to perform poorly during a near-source earthquake are identified with an "H."

Table-2 Potential Shelters in and Near the City of Glendale

(for the location of the shelter closest to you, refer to Plate P-3)

		Address	Buildings	Building Capacity	Phone Number*
Number on Map	**Parks and Facilities**				
1	Adult Recreation Center	210 E. Colorado Street	Yes	75	818-548-3775
2	Brand Park Studios	1601 W. Mountain Street	Yes	40	818-548-3782
3	Civic Auditorium	1401 N. Verdugo Road	Yes	600	818-548-2147
4	Crescenta Valley County Park	3901 Dunsmore Avenue L.C.	Yes	40	No Phone
5	Fremont Park	600 W. Hahn Avenue	No		No Phone
6	Glendale Armory	220 E. Colorado Street	Yes	250	No Phone
7	Glenoaks Park	2531 E. Glenoaks Blvd.	Yes	40	No Phone
8	Griffith Manor Park	1551 Flower Street	Yes	25	No Phone
9	Maple Park	820 E. Maple Street	Yes	130	818-548-3785
10	Pacific Park	501 S. Pacific Avenue	No		No Phone
11	Scholl Canyon Ballfields	3200 E. Glenoaks Blvd.	No		No Phone
12	Scholl Canyon Park	2849 E. Glenoaks Blvd.	No		No Phone
13	Sparr Heights Senior Center	1613 Glencoe Way	Yes	40	818-548-2187
14	Verdugo Park	1621 Cañada Blvd.	No		No Phone
	Schools and Colleges				
15	Glendale Community College	1500 N. Verdugo Road	Yes		818-240-1000
16	Glendale Community College Garfield Campus	1122 E. Garfield Avenue	Yes		818-240-1000 (ext. 5678)
17	R.D. White Elementary	744 E. Doran Street	Yes		818-241-2164
18	John Marshall Elementary	1201 E. Broadway	Yes		818-242-6834
19	Thomas Edison Elementary	440 W. Lomita Avenue	Yes		818-241-1807
20	Balboa Elementary	1844 Bel Aire Drive	Yes		818-241-1801
21	Hoover High School	651 Glenwood Road	Yes		818-242-6801
22	Allan F. Daily High School	220 N. Kenwood	Yes		818-247-4805
23	Crescenta Valley High School	4400 Ramsdell Avenue	Yes		818-249-5871
24	Glendale High School	1440 E. Broadway	Yes		818-242-

					3161
25	Anderson W. Clark Magnet High School	4747 New York Ave	Yes		818-248-8324

Table-3 Program Implementation Schedule

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
Seismic and Geologic Hazards					
1-1.1	Adopt Building Code Amendments	Community Development/Building & Safety	N/A	High	Every 3 years
1-1.2	Hire and train staff knowledgeable on the Building Codes	Community Development/Building & Safety	N/A	High	On-going
1-1.3	Encourage seismic improvements	Public Works, Community Development/Building & Safety	N/A	High	On-going
1-1.4	Cooperate with G.U.S.D. to improve the structural safety of their buildings	Community Development/Building & Safety	N/A	High	On-going
1-2.1	Require geological studies for projects in identified hazards zones	Public Works/Engineering, Community Development/Building & Safety and Planning	N/A	High	On-going
1-2.2	Require geological studies for critical facilities projects in the hazards zones of the Verdugo, Lukens, Hollywood and Sycamore Canyon faults	Public Works/Engineering, Community Development/Building & Safety and Planning	N/A	High	On-going
1-2.3	Require liquefaction assessment studies	Public Works/Engineering, Planning	N/A	High	On-going
1-2.4	Require slope stability analyses	Public Works/Engineering, Planning	N/A	High	On-going
1-3.1	Review seismic vulnerability of essential facilities	Public Works, Community Development/Building & Safety	N/A	Moderate	3 years
1-3.2	Replace piping and fittings in City-owned water tanks	Glendale Water & Power	GWP Budget	High	1 year
1-3.3	Annual review of dams and water storage facilities	Glendale Water & Power	GWP Budget	High	On-going
1-4.1	Develop and make available to public a list of State certified geologists and soils engineers	Public Works/Engineering	PW Budget	Moderate	1 year
1-4.2	Provide State with updated information on seismic hazards	Public Works, Community Development/Building & Safety	PW Budget	High	On-going
1-5.1	Update Safety Element as needed	Community Development/Planning	General Fund	Moderate	As Needed
1-5.2	Develop web-based information for public regarding seismic hazards and safety strategies	Public Works, Community Development/Building & Safety	PW and CDD Budget	Moderate	1 year
1-5.3	Promote earthquake preparedness through publications in various languages	Public Works, Community Development/Building & Safety	PW and CDD Budget	Moderate	1 year
1-5.4	Provide information about radon gas hazards	Community Development/Building & Safety	CDD Budget	Low	3 years

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
Seismic and Geologic Hazards					
2-1.1	Require geological and geotechnical investigations in areas of potential hazard	Public Works/Engineering, Community Development/ Building & Safety and Planning	N/A	High	On-going
2-1.2	Require preliminary geological investigations of tract sites	Public Works/Engineering, Community Development/ Building & Safety and Planning	N/A	High	On-going
2-1.3	Require geotechnical investigation in areas susceptible to slope instability	Public Works/Engineering, Community Development/ Building & Safety and Planning	N/A	High	On-going
2-1.4	Discourage unnecessary grading. Inspect grading operations to ensure safety.	Public Works/Engineering, Community Development/ Building & Safety and Planning	N/A	High	On-going
2-1.5	Prohibit grading that is inconsistent with the Grading Ordinance	Public Works/Engineering, Community Development/ Building & Safety and Planning	N/A	High	On-going
2-1.6	Prohibit reconstruction of structures meant for human habitation that were destroyed by failed slopes	Community Development/Building & Safety and Planning	N/A	High	On-going
2-2.1	Consider establishing a regular inspection and maintenance cycle for existing physical landslide and debris flow defenses	Public Works, Community Development (Building & Safety)	PW and CDD Budget	Moderate	On-going
2-2.2	Consider implementing strategies to address increasing vulnerabilities associated with debris flow and landslides	Public Works, Community Development (Building & Safety)	PW and CDD Budget	Moderate	3-years
2-2.3	Consider identifying locations where slopes should be actively monitored and install landslide monitoring equipment	Public Works, Community Development (Building & Safety)	PW and CDD Budget	Moderate	2 years
Flooding Hazards					
3-1.1	Participate in National Flood Insurance Program	Public Works/Engineering	N/A	Moderate	On-going
3-1.2	Discourage reconstruction of critical facilities if located in inundation pathways	Public Works/Engineering	N/A	High	On-going
3-1.3	Fully mitigate potential impacts to flood control system by new development	Public Works/Engineering	N/A	High	On-going
3-1.4	Maintain City-owned storm drain facilities	Public Works/Engineering	PW Budget	High	On-going
3-1.5	Upgrade stormwater systems on City-owned properties and rights-of-way to limit flooding from extreme precipitation events	Public Works/Engineering	PW Budget	High	On-going
3-1.6	Implement flood mitigation measures to mitigate	Public Works/Engineering	PW Budget	High	On-going

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
	increased flood risk due to climate change along the Verdugo Wash				

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
Fire Hazards					
4-1.1	Conduct annual fire flow tests	Fire	N/A	Moderate	On-going
4-1.2	Prepare periodic Fire Station location and Resource studies	Fire	N/A	Moderate	As needed
4-1.3	Road standards shall meet needs for emergency access	Fire, Public Works/Engineering	N/A	Moderate	On-going
4-1.4	Improve emergency access for areas below standards	Fire, Public Work	N/A	Moderate	As needed
4-1.5	Install signal preemption devices at critical intersections	Fire, Public Works/Transportation	Unknown	Moderate	Under study
4-1.6	Evaluate impact of traffic calming devices on emergency response times	Fire, Public Works/Transportation	N/A	Moderate	On-going
4-1.7	Monitor and identify current trends that may impact emergency services	Fire, Police	N/A	Moderate	On-going
4-1.8	Determine if improvements are needed in public education and fire prevention	Fire	N/A	Low	On-going
4-1.9	Ensure that road standards meet the needs for emergency access	Public Works/Engineering		High	On-going
4-1.10	Coordinate with telecommunication service entities to fire-harden communications	Public Works/Engineering	N/A	High	2 years
4-1.11	Ensure that adequate equipment, staffing, training, and resources are provided to meet current and future projected service demands and fire protection needs	Fire	Fire Budget	High	On-going
4-1.12	The City shall coordinate with the Glendale Water Department and other water districts to support adequate water storage during a wildfire event	Fire, Glendale Water Department, Public Works	N/A	Moderate	On-going
4-2.1	Encourage planting and maintenance of fire-resistant landscaping	Fire, Community Development/Planning	N/A	Moderate	On-going
4-2.2	Enforce Weed Abatement Program in high fire hazard areas	Fire	Currently Budgeted	High	On-going
4-2.3	Require fuel management plans for new development	Fire	N/A	Moderate	As needed
4-2.4	Enforce the Uniform Fire Code and Municipal Fire Code Amendments	Fire	Currently Budgeted	High	On-going
4-2.5	Consider fire safety issues when making revisions to the Zoning Ordinance	Community Development/Planning, Fire	N/A	Moderate	As needed
4-2.6	Develop program to monitor and enforce mitigation measures and conditions of approval applied to projects	Community Development/Planning	N/A	Moderate	1 year
4-2.7	Enforce Class A roofing and	Community	N/A	High	On-going

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
	encourage upgrading existing wood roofs	Development/Building & Safety			

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
4-2.8	Require that new subdivision tracts with 30 or more lots provide adequate access and a minimum of two roadways	Public Works, Community Development/Building & Safety and Planning	N/A	High	On-going
4-2. 9	Locate new essential public facilities outside Very High Fire Hazard Severity Zones	Public Works, GWP	N/A	High	On-going
4-5.1	Support the provision of adequate water and water storage to meet future peak fire demands	GWP, Fire	GWP Budget	High	On-going
4-5.2	Require all new developments to have adequate water supply to meet fire suppression needs	GWP, Fire	N/A	High	On-going
4-7.1	Require development and maintenance of buffer zones and defensible space	Fire, Public Works, Community Development/Building & Safety	N/A	High	On-going
4-7.2	Encourage residents to maintain drought and fire-resistant landscapes	Public Works, Community Development	N/A	High	On-going
4-8.1	Establish minimum standards for evacuation and emergency vehicle access to and from new or planned development	Fire, Public Works, Community Development	N/A	Moderate	On-going
4-9.1	Host educational workshops for property owners on defensible space, home hardening, and vegetation management	Fire	Fire Budget	Moderate	On-going
4-9.2	Conduct studies to determine whether improvements are needed in the areas of public education and fire prevention	Fire	Fire Budget	Moderate	On-going
5-3.2	Conduct emergency alert notifications in English, Spanish, Armenian, and Korean	Information Technology, Fire Department, Community Development, Police, City Manager		High	Ongoing
5-3.3	Every five years, reassess which languages are spoken in the Glendale community and expand emergency alert translations	Information Technology, Fire Department, Community Development, Police, City Manager		High	On-going
5-3.4	Provide online information for preparing homes and businesses for extreme weather events	Information Technology, Fire Department, Community Development, GPD, City Management		Moderate	On-going
5-4.1	Upon the next update to the Urban Water Management Plan (UWMP), consider the longest recorded drought	GWP		High	2 years
5-4.2	Expand Glendale Water and Power programs to reduce water use	GWP		Moderate	3 years
5-4.3	Implement a program to conduct an energy/water nexus study	GWP		High	2 years
Hazardous Materials					

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
6-1.1	Enforce the 7 Unified Program elements related to hazardous materials	Fire/Hazardous Materials	Permit Fees	High	On-going
6-1.2	Identify roadways used to transport hazardous materials and critical facilities near such routes	Fire/Hazardous Materials	Area Plan	High	2 years
6-1.3	Evaluate hazardous materials during environmental review process for new buildings	Community Development/Planning, Fire/Hazardous Materials	Plan check/ permit fees	High	On-going
6-1.4	Maintain ability to respond to hazardous materials incidents in the City	Fire/Hazardous Materials	General Fund/ EMC/EOC	High	On-going
6-1.5	Encourage public to eliminate or reduce use of hazardous materials	Fire/Hazardous Materials	Disposal fee/ State grants	High	On-going
6-1.6	Continue to support recycling centers	Fire/Hazardous Materials	Disposal fee/ State grants	Moderate	On-going
6-1.7	Review direction of City's Certified Unified Program Agency	Fire/Hazardous Materials	EMC Budget	Moderate	On-going
6-1.8	Coordinate hazardous materials regulation with other agencies	Fire/Hazardous Materials	N/A	Moderate	On-going
Terrorism, Civil Disturbance and Crime					
7-1.1	Review and update confidential list of potential targets in the City	Police	N/A	High	On-going
7-1.2	Study ways to minimize collateral damage to potential targets	Police	N/A	High	On-going
7-1.3	Study access problems of major routes in the event of an attack or civil unrest	Police	N/A	High	Ongoing
7-1.4	Identify staging sites near high risk assets	Fire, Police	N/A	Moderate	On-going
7-1.5	Conduct emergency response exercises	Fire, Police	N/A	High	On-going
7-1.6	Protect essential City facilities from attack	Police, GWP, Fire, Information Technology	N/A	High	On-going
7-1.7	Review Police training and plans for dealing with terrorist attacks	Police	Grants	High	On-going
7-1.8	Annually review plans to respond to a large-scale incident, such as a terrorist incident	Police/SPE Working Group	N/A	High	On-going
7-2.1	Monitor crime statistics to look for trends	Police	N/A	High	On-going
7-2.2	Educate the public about neighborhood watch and similar programs	Police	COPS Grants	Moderate	On-going
Dangerous Animal & Plant Hazards					
8-1.1	Make information available to the public in regards to hazardous animals	Parks and Recreation	Grants	High	On-going

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
8-1.2	Make information available to the public in regards to dangerous plants	Parks and Recreation	Grants	High	On-going
8-2.1	Provide residents with animal-proof trash receptacles	Public Works/Maintenance Services	Parks/PW Grants	Low	5 years
8-2.2	Work with Forest Rangers to monitor wild animal sightings and publicize information	Parks and Recreation/City PIO	N/A	Low	On-going

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
8-2.3	Encourage residents to use enclosed composting bins	Parks and Recreation/PW Integrated Waste Mgmt.	PW Integrated Waste Mgmt. Grants	Low	On-going
8-2.4	Encourage residents to have pets vaccinated and publicize the benefits of flea control	City Clerk	N/A	Low	On-going
8-2.5	Look for and report unusual numbers of dead rodents or birds	Parks and Recreation	N/A	High	On-going
8-2.6	Monitor coyote population and relocate aggressive coyotes	Parks and Recreation	Parks	Moderate	On-going
Disaster Preparedness, Recovery and Emergency Response					
9-1.1	Update preparedness and recovery plans	All City Divisions	N/A	High	On-going
9-1.2	Maintain and update participants in the City's emergency response organization	Fire, Police	N/A	High	On-going
9-1.3	Maintain mutual aid agreements with other agencies	Fire, Police	N/A	High	On-going
9-1.4	Establish traffic control plans for disaster routes	Police	N/A	Moderate	On-going
9-1.5	Publicize information about disaster preparedness	Fire	N/A	High	On-going
9-1.6	Promote development of evacuation plans in high-rise buildings, immobile population centers, businesses that use hazardous substances and in other critical facilities.	Fire	N/A	Moderate	On-going
9-1.7	Compile and maintain information about facilities that may require specialized response.	Fire/Police/GWP/Public Works	N/A	Moderate	On-going
9-1.8	Continue to participate in emergency preparedness exercises	All City Divisions	N/A	Moderate	On-going
9-1.9	Inventory equipment needed for emergency preparedness	Fire/EOC/Police/Public Works/GWP/Finance--Logistics	N/A	High	On-going
9-1.10	Assess existing City buildings, to determine retrofits needed for long-term resilience to climate change-affected hazards	Public Works, Community Development/Building & Safety	N/A	High	On-going
9-1.11	Provide accurate documentation for cost recovery efforts from federal, state, and other agencies in the event of disaster.	All City Divisions	N/A	High	As needed
9-3.1	Implement communication-related strategies in the Evacuation Analysis (Appendix C)	Public Works, Police, Fire, Information Technology, City Management	N/A	High	On-going
9-3.2	Increase redundancy in emergency evacuation	Information Technology, Fire, Public Works	N/A	High	On-going

No.	Program	Responsible Division	Potential Funding	Priority	Time Frame (years)
	communication systems				
9-4.1	Implement strategies for evacuation of vulnerable populations in Evacuation Analysis (Appendix C)	CSP, City Management (Public Information),	N/A	High	On-going
9-5.1	Implement roadway and intersection capacity and resilience-related strategies in Evacuation Analysis (Appendix C)	Public Works, Police	N/A	High	On-going
9-5.2	Implement strategies to improve emergency access for single-access neighborhoods	Public Works, Police	N/A	High	On-going

Plate P-1 Seismic Hazards - Updated

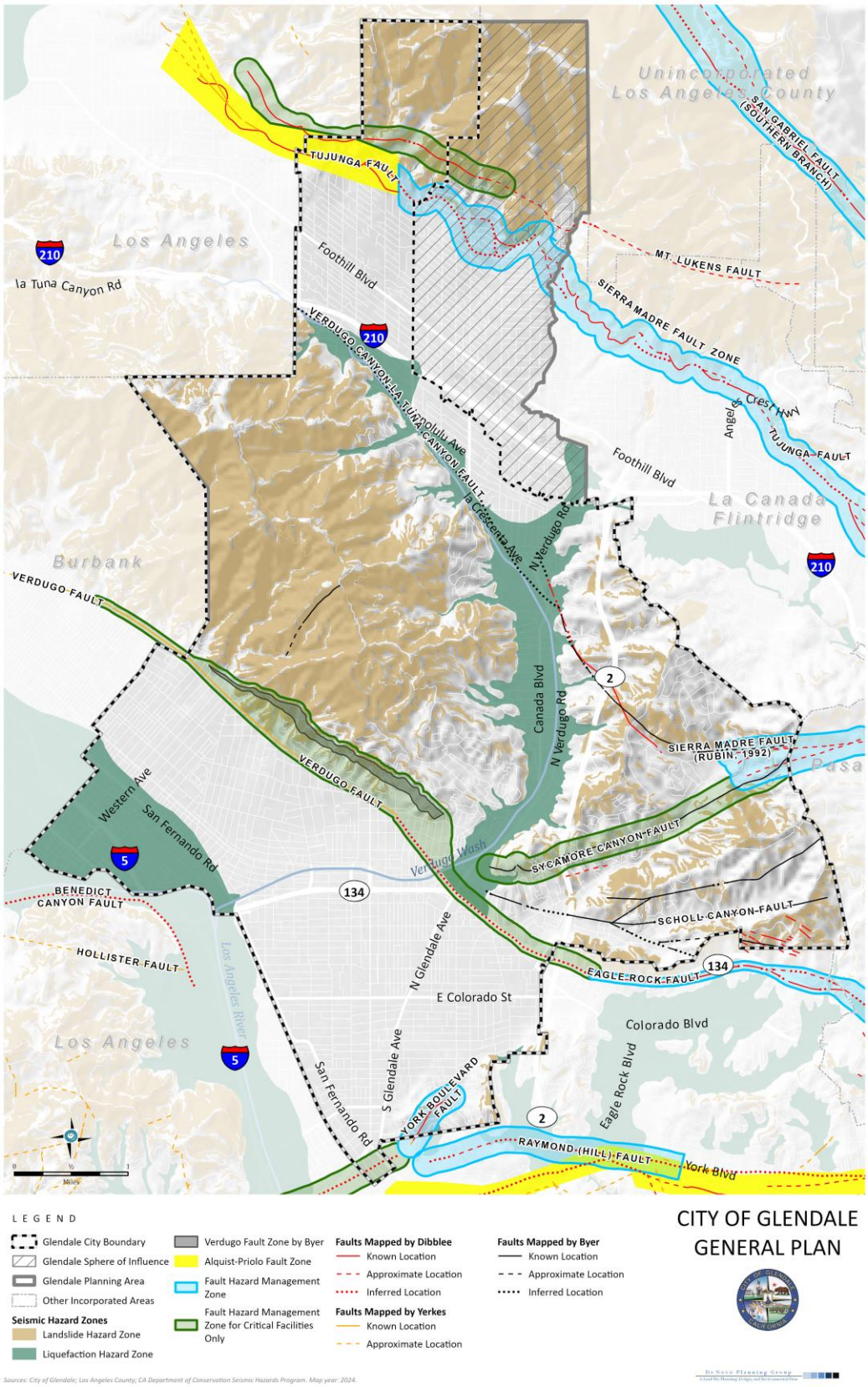
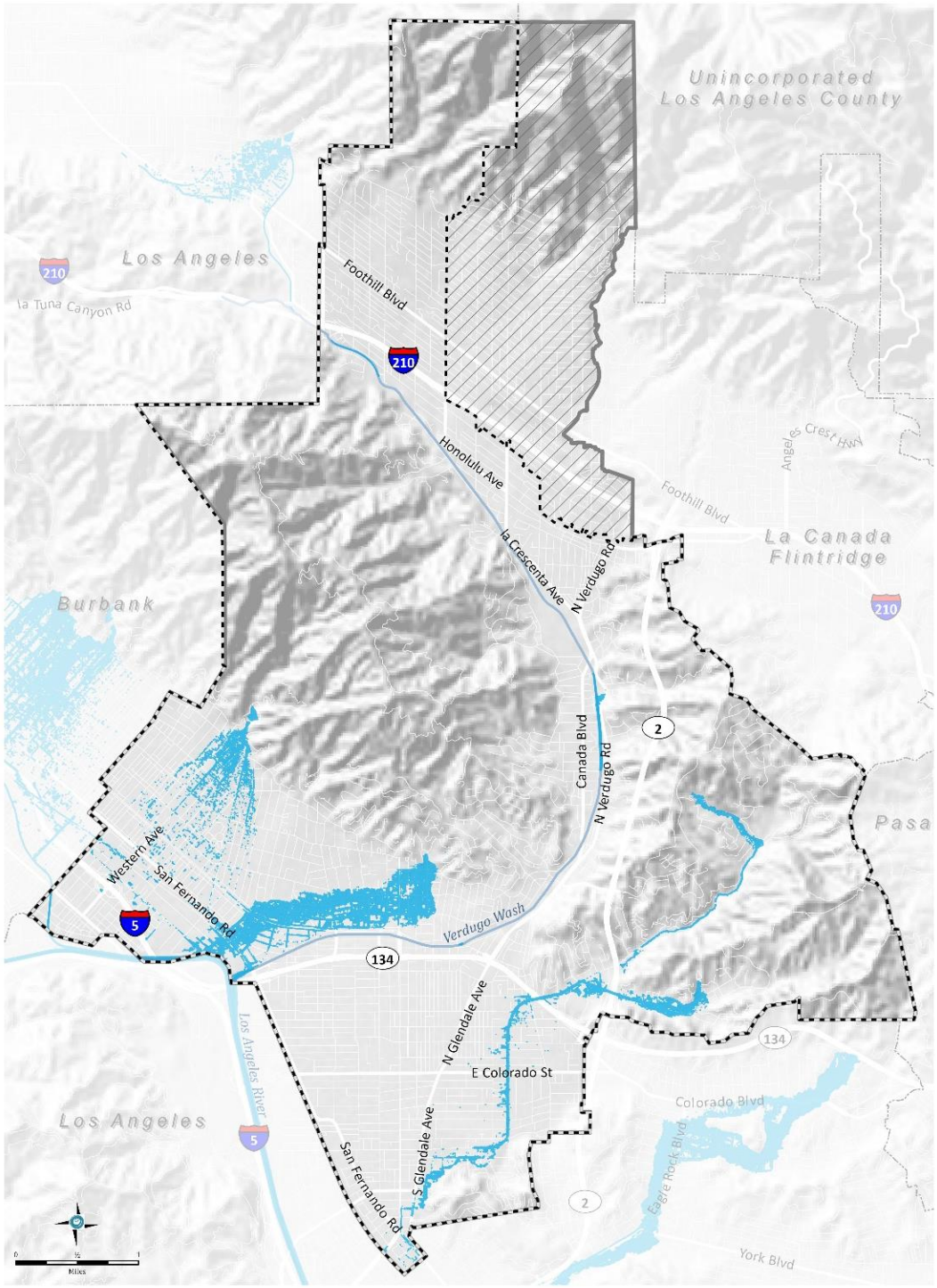


Plate P-2 Dam Inundation Zones - Updated



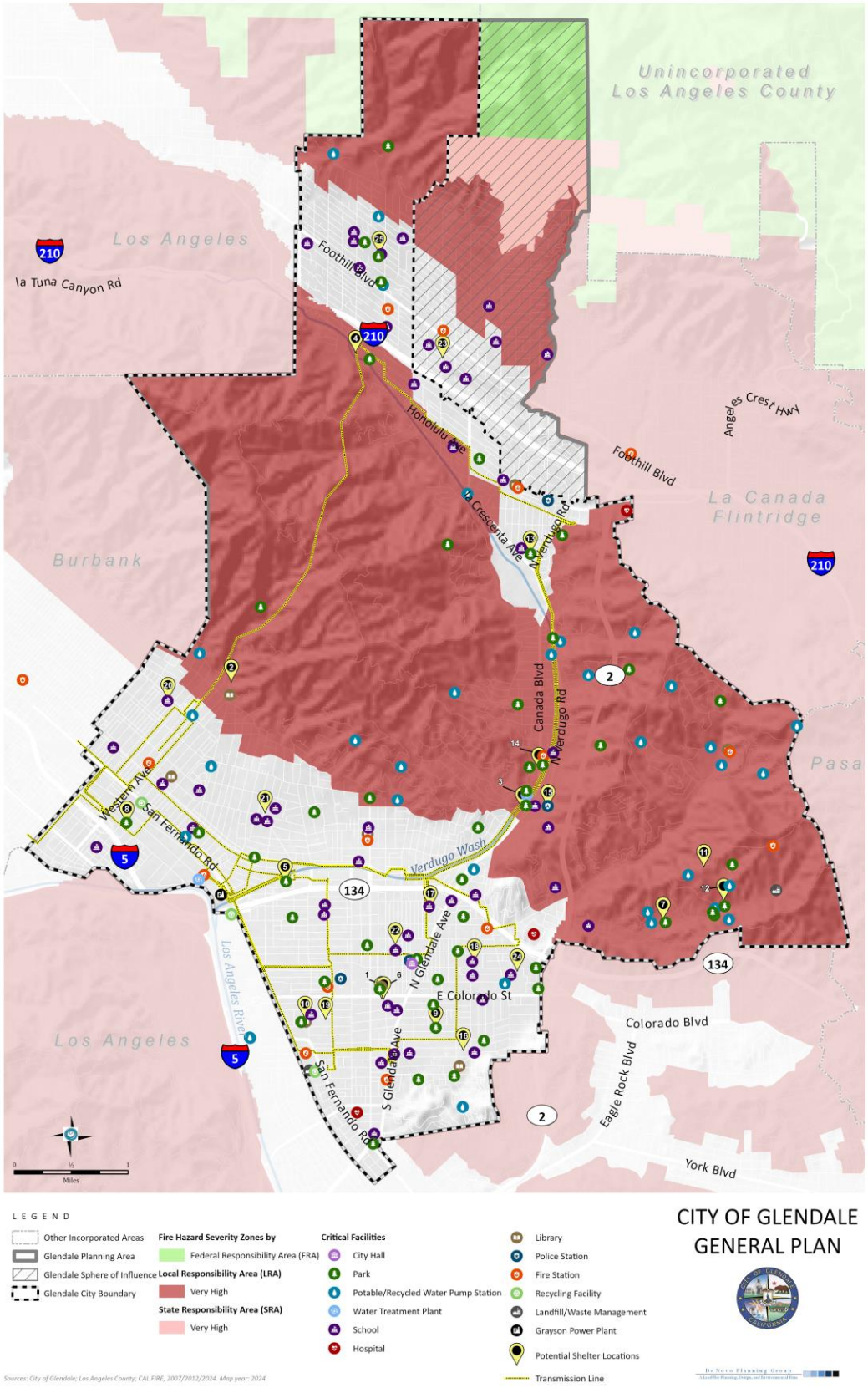
LEGEND

- Glendale City Boundary
- Glendale Sphere of Influence
- Glendale Planning Area
- Other Incorporated Areas
- Dam Inundation Areas

CITY OF GLENDALE
GENERAL PLAN

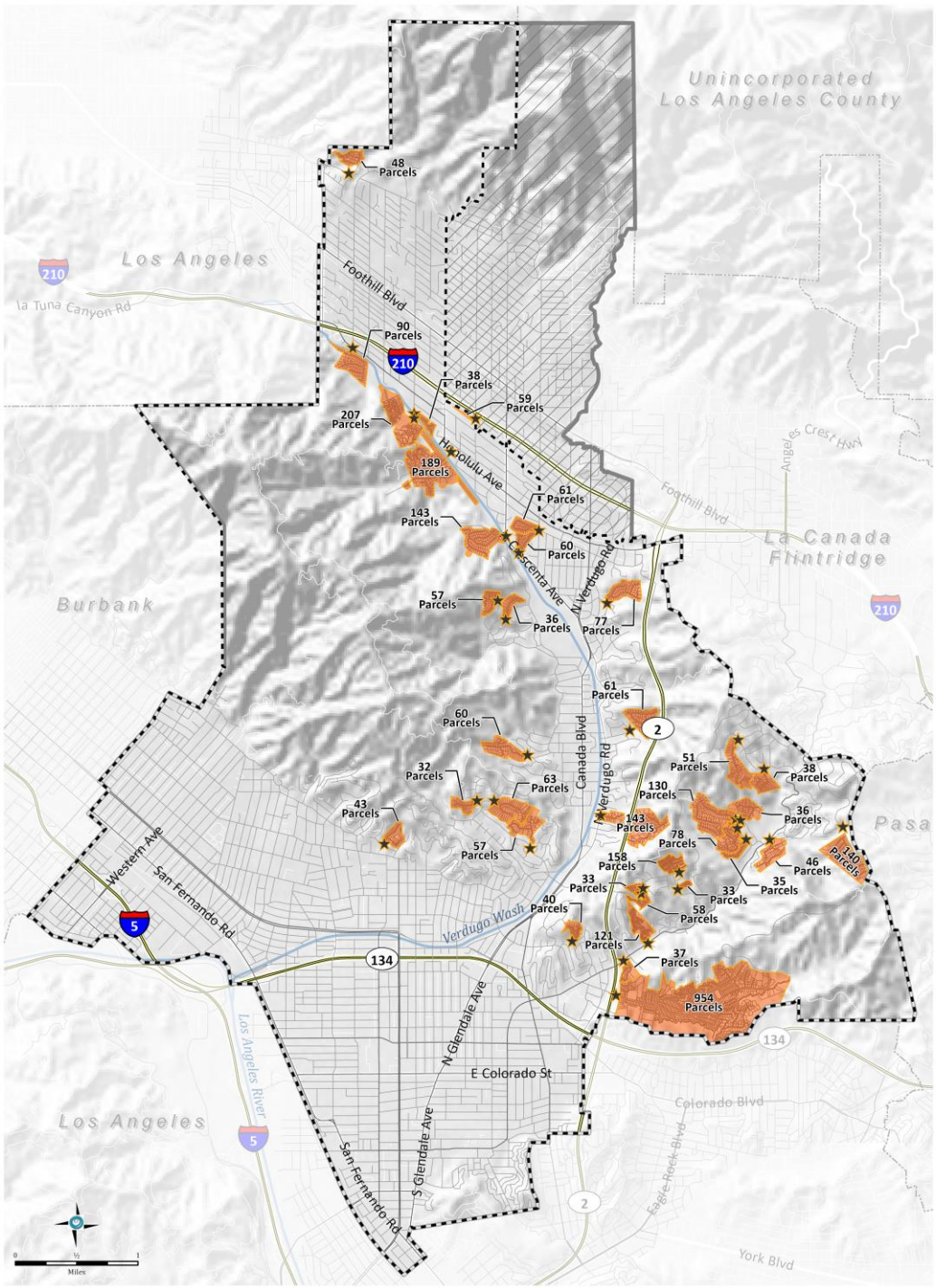
Sources: City of Glendale; Los Angeles County; USGS Dam Breach Inundation, 2023. Map year: 2024.

Plate P-3 Wildfire Hazard Severity Zones and Critical Facilities - Updated



RPC 2(b)(ii)

Plate P-4 Single Access Neighborhoods - New



LEGEND

- Glendale City Boundary
- Glendale Sphere of Influence
- Glendale Planning Area
- Other Incorporated Areas
- City Street
- Major Road
- Interstate/Highway
- Single-Access Point
- Single-Access Neighborhood

CITY OF GLENDALE
GENERAL PLAN

Sources: City of Glendale; Los Angeles County. Map year: 2024.
5899 Single-Access Residential Development Analysis conducted by Rincon Consultants, Inc., 2024.

De Novo Planning Group

Plate P-5 Emergency Response Route - Updated