Introduction to Public Safety

The goal of Lake Forest's Public Safety Element is to reduce the risk of death, injury, property damage, economic loss, and harm due to natural and manmade disasters. This element will view risks on both a short-term and long-term basis, and will place a special emphasis on local and regional risk factors.

The Public Safety Element closely relates to the Public Facilities Element and supports the City's Emergency Management Plan. The long-term risks associated with Climate Change are also addressed in here.

Organization of Element

The Public Safety Element will address each of the topics below as they relate to Lake Forest. The goals and policies of this element are organized around the following topics:

- *Seismic and Geologic Hazards*
- *Fire Safety*
- *Flooding*
- *Hazardous Waste and Materials*
- *Emergency Operations*
- *Noise*
- *Climate Change and Resiliency Planning*

Contents:

Related Plans, Programs, and Regulations

The following Plans, Programs, and Regulations are incorporated by reference into the City of Lake Forest's Public Safety Element.

City of Lake Forest

- **Fire Code:** The City has adopted the 2019 California Fire Code, and this is codified in Chapter 8.24 of the Municipal Code. It includes information on fuel modification zones and requirements.

- **Fire Hazard Area Requirements:** Municipal Code section 7.08.145 includes requirements for subdivisions proposed to be located in an area shown in the General Plan to be a high or very hgih fire hazard area. It states they shall provide appropriate fire protection by means of firebreaks, fuel modification programs, access roads, sufficient water supply, landscaping, and open spaces, and such other methods that the Fire Chief has determined will ensure the public health, safety, and welfare of the future occupants of the subdivision and the adjacent area.

- **Fire Hazard Education Programs:** The City reduces the potential for dangerous fires by coordinating with OCFA to offer a variety of educational programs including safety presentations, fire station tours, school programs, and community events.

- **Climate Vulnerability Assessment (CVA):** The City prepared a Climate Vulnerability Assessment (CVA) in 2021 to inform City policies, plans, programs, and guidance to promote effective and integrated action to safeguard from climate change. The CVA is included as Appendix A.

- **Residential Emergency Evacuation Route Analysis:** The City prepared an analysis, referred to as a White Paper, consistent with Senate Bill 99 to identify residential developments in hazard areas that do not have at least two emergency evacuation routes. The White Paper includes definitions and data sources as well as assumptions and methodology used to map the evacuation routes. The analysis identified four residential areas in high hazard zones (as defined in the White Paper) that warrant further study. While all residential developments meet City standards, the City will continue to coordinate with Orange County Fire Authority and Orange County Sheriff's Department to provide ongoing education to residents about how to safely evacuate in the event of an emergency. Law enforcement will identify the appropriate routes and assist residents leaving the City in the event an evacuation of all or part of the City is required. The White Paper is included as Appendix B to the Safety Element.

County of Orange

- **Local Hazard Mitigation Plan (LHMP):** The City is a participating jurisdiction in the County of Orange and Orange County Fire Authority Local Hazard Mitigation Plan, adopted in 2015. An update is currently being prepared and the Public Review Draft was released in May 2021. The countywide plan identifies risks posed by natural and manmade disasters including earthquake, flood, wildland and urban fire, climate change, dam failure, epidemic, drought, tsunami, and landslide, and provides measures to minimize damage from those disasters. Additionally, the City is currently under contract with a consultant and initiated the preparation of a City LHMP in early 2022.

- **Emergency Operations Plan (EOP):** The Unified County of Orange and Orange County Operational Area (OA) Emergency Operations Plan (EOP), adopted in February 2019, describes the emergency organization and provides guidance and procedures to prepare for and respond to natural, technological, conflict-related, and human-caused incidents creating situations requiring a coordinated response. The EOP includes evacuation procedures and responsibilites. The City is a member of the Orange County Operation Area and the Orange County Emergency Management Organization which both provide mutual aid to communities via the Orange County Sheriff's Department, Orange County Fire Authority and the State of California Office of Emergency Services. In the event of a large wildfire within or threatening City limits, the City could be assisted by state and federal agencies, and/or other jurisdictions.

GOAL PS-1 SEISMIC AND GEOLOGIC HAZARDS

A community that is adequately prepared for natural hazards related to landslides, geologic instability, and seismic activity.

PS-1 Policies

PS-1.1 **Geologic Hazard Identification**. Maintain the City's geologic and seismic hazards map in concert with updates from the California Geologic Survey and local surveys and update as appropriate.

PS-1.2 **Earthquake Protection**. Enforce State seismic design guidelines and all relevant building codes to reduce the risk of damage associated with seismic activity.

PS-1.3 **Liquefaction**. Require special site-specific studies in areas potentially subject to liquefaction (shown in Figure 9-5 of the General Plan Existing Conditions Report) to determine the nature and extent of possible liquefaction and to identify engineering and development siting measures to permit development to occur.

PS-1.4 **Development**. Require assessment and mitigation of hazards related to liquefaction, landslides, and flooding for new development projects or City improvement projects that are identified by the City as susceptible to these hazards.

PS-1.5 **Risk Inventories**. Develop inventories of at-risk public buildings and infrastructure within the City of Lake Forest and evaluate potential mitigation projects to address risks, as financially feasible.

PS-1.6 **Critical Facilities**. Require new critical infrastructure and facilities that may be built in the City to incorporate site specific seismic structural design as required by applicable building codes.

PS-1.7 **Public Education**. Educate the public through programs and outreach materials on natural threats pertaining to Lake Forest and best practices for reducing damage and personal harm.

PS-1 Actions

PS-1a Review development proposals to ensure compliance with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind.

PS-1b Update building, zoning, and grading codes as needed to ensure adopted standards mitigate potential seismic hazards and comply with the Alquist-Priolo Act and Unreinforced Masonry Law.

PS-1c Establish a public relations and education program to increase public awareness on potential geologic and seismic hazards in the community, their associated risks, and preparedness strategies.

GOAL PS-2 FIRE SAFETY

A City that is safe and adequately prepared for urban and wildfire emergencies.

Fire protection services in the City are provided by Division 5 of the Orange County Fire Authority (OCFA), Battalion 4. OCFA provides fire protection and suppression, inspection services, paramedic emergency medical services and hazardous material response. There are three OCFA stations within City limits:

- Station 19 - 23022 El Toro Road, Lake Forest 92630
- Station 42 - 19150 Ridgeline Road, Lake Forest 92679
- Station 54 - 19811 Pauling Avenue, Lake Forest 92610

The Community Risk Reduction Department of OCFA adopts and enforces codes and ordinances relative to fire and life safety issues, reviews plans and conducts inspections of construction projects, coordinates annual life safety inspections of all existing commercial buildings, provides long range analysis of impacts on resources associated with future land use and development, and investigates all fires. There are three Sections within the Department, further described below in more detail:

- The Planning and Development Services Section interacts with developers, architects, and engineers to meet the fire protection requirements for buildings and developments by reviewing all architectural development plans and proposals submitted in OCFA's jurisdiction. This includes tract and parcel maps, permits for conditional use, site development, coastal development, and other items related to the developmental process.
- The Pre-Fire Management Section takes a proactive approach to wildland fire prevention through the systematic evaluation of risk, fuels mitigation, road maintenance, vegetation management/home hardening education, plus ongoing collaboration with partner organizations, land owners and communities.
- The Prevention Field Services Section assists stakeholders in maintaining and enhancing safe communities by conducting fire safety inspections, enforcing and educating about applicable fire codes and ordinances, assuring that public safety issues are researched and addressed as appropriate. There are four regional offices that focus the risk reduction efforts more closely to the risks of the individual communities.

To better prepare for wildfires, the California Department of Forestry and Fire Protection (CAL FIRE) is required to classify the severity of fire hazards throughout the state. While most of California is subject to some degree of fire hazard, there are specific features that make some areas more hazardous. CAL FIRE is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These designations, referred to as Fire Hazard Severity Zones (FHSZ), mandate how people construct buildings and protect property to reduce risk associated with wildland fires. The FHSZ maps denote lands where the state has financial responsibility for wildland fire protection, known as State Responsibility Area (SRA) and areas where local governments have financial responsibility for wildland fire protection, known as Local Responsibility Area (LRA). Within each, there are three levels of hazards: moderate, high, and very high. Per law, only lands designated as Very High Fire Hazard Severity Zones (VHFHSZs) are identified within LRAs. Figure PS-1 shows VHFHSZs in the LRA for Lake Forest as recommended by CAL FIRE. There are no SRAs in Lake Forest. Most of the Foothill Ranch and Portola Hills neighborhoods are within the VHFHSZ, as well as fire stations 42 and 54. The CAL FIRE map was last updated in 2011, and CAL FIRE is currently working on updates to incorporate improved fire science, data, and mapping techniques.

PS-2 Policies

PS-2.1 **Building Fire Codes**. Require that all buildings and facilities within Lake Forest comply with local, state, and federal regulatory standards such as the California Building and Fire Codes as well as other applicable fire safety standards.

PS-2.2 **Fire Protection Services**. Coordinate on an ongoing basis with OCFA and CAL FIRE as it protects the safety and security of the Lake Forest community.

PS-2.3 **Fire Hazard Identification**. Maintain and regularly update the City's Very High Fire Hazard Severity Zone (VHFHSVs) (Figure 1) map for changes in fire hazard severity districts consistent with changes in hazard designations by CAL FIRE.

PS-2.4 **Very High Fire Hazard Severity Zones**. Require that all development in VHFHSVs meet the following standards:

a. Minimize new residential development in VHFHSVs when possible.

b. Coordinate with OCFA to ensure adequate fire protection services, fire protection plans, and emergency vehicle access are provided for new development in VHFHSVs.

c. As part of future a land use plan updates or amendments, assess site constraints when considering land use designations near wildlands to avoid or minimize wildfire hazards.

d. Coordinate with OCFA to identify building and site design methods or other methods to minimize damage if new structures are proposed to be in VHFHSVs on undeveloped land and when rebuilding after a fire.

e. As part of the OCFA review process, require ongoing brush management, fuel management/modification, defensible space, fire retardant landscaping, and other project design features for new development located in areas of or adjacent to high wildfire risk.

f. Coordinate with the applicable water district to ensure necessary water supply systems and flow for structural fire suppression are provided and maintained.

g. Work with OCFA and local HOAs to identify and maintain fire hazard reduction projects, including community fire breaks and private road and public road clearance.

h. Coordinate with OCFA to define minimum standards for evacuation of residential areas in VHFHSVs. If areas with inadequate access/evacuation routes are identified, develop appropriate mitigation measures, improvement plans, or education programs to ensure safe evacuation.

PS-2.5 **Fire Safe Design.** As part of OCFA's development review process, consider the following fire safe design measures (i.e., fire-resistant building and site design, materials, and landscaping) for development within VHFHSVs.

a. Locate, design and construct development to provide adequate defensibility and minimize the risk of structural loss from wildland fires .

b. Design development on hillsides and canyons to reduce the increased risk of fires from topographic features (e.g., steep slopes, ridge saddles).

c. Minimize flammable vegetation and implement brush management best practices in accordance with OCFA approved Fuel Modification Plans.

d. Require visible home and street addressing and signage.

PS-2.6 **Urban Fire Risks**. Work with the City's fire service provider to maintain an ongoing fire inspection program to reduce fire hazards associated with multifamily development, critical facilities, public assembly facilities, industrial buildings, and nonresidential buildings.

PS-2.7 **Grant Funding**. Seek grant funding, on our own and in collaboration with regional partners, to mitigate potential wildfire threats to the community and to implement special training workshops and projects related to defensible space and fuel reduction practices.

PS-2.8 **Regional Coordination**. Coordinate with the County of Orange, neighboring cities, and other fire protection agencies to reduce the potential for wildfire hazards in the Saddleback Valley.

PS-2.9 **Interagency Support**. Participate in the mutual aid system and automatic aid agreements to back up and supplement capabilities to respond to emergencies.

PS-2.10 **Educational Programs**. Work with OCFA to disseminate educational programs on fire safety measures, such as defensible space and evacuation routes, and fire hazard risks for residents living in or adjacent to VHFHSVs, with a special focus on at-risk populations such as senior citizens, people with pre-existing health conditions, and persons experiencing homelessness.

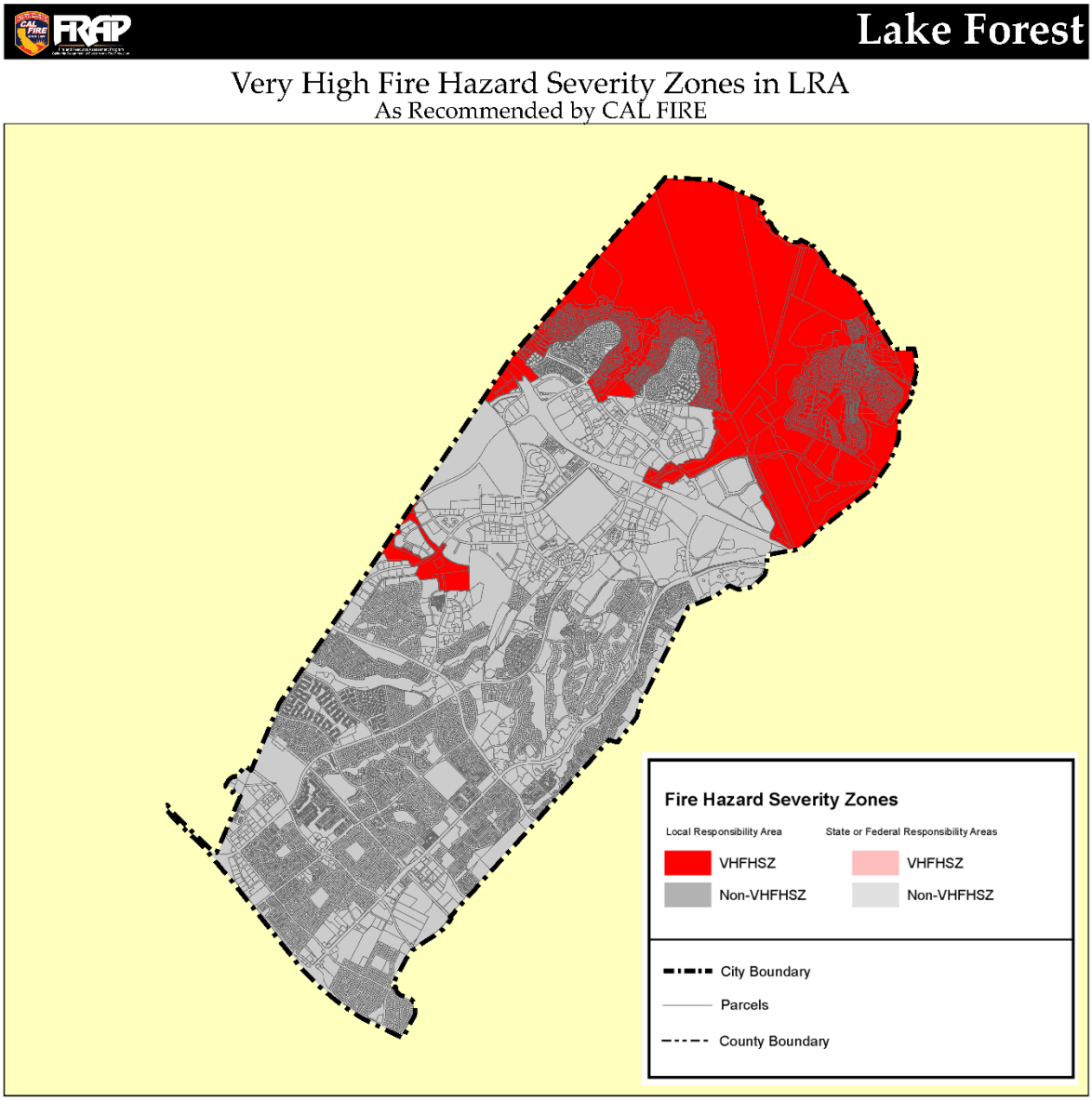
PS-2.11 **Post-fire Treatment.** Work with CAL FIRE, United States Forest Service, United States Geological Service, and applicable nongovernmental agencies to create a plan to address post-fire recovery activities and projects that allow burned areas to fully recover and minimize repetitive losses and further damage.

PS-2.12 **Local Hazard Mitigation Plans.** Once it is adopted, update the City's Local Hazard Mitigation Plan as necessary.

PS-2.13 **Essential Public Facilities and Infrastructure.** Locate, when feasible, new essential public facilities and infrastructure outside of very high fire hazard severity zones, including but not limited to, hospitals and health care facilities, emergency shelters, emergency command centers, emergency communication facilities, and utilities or identify construction methods or other methods to minimize damage if these facilities must be located in VHFHSVs.

PS-2.14 **Future Emergency Service Needs**. Coordinate with fire protection, emergency service, and water providers to reassess fire hazards and future availability of water supplies after wildfire events to adjust fire prevention and suppression needs, as necessary, for both short- and long-term fire prevention.

Figure PS-1: Very High Fire Hazard Severity Zone Map



Source: CAL FIRE Fire Hazard Severity Zones Maps website: https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/, accessed December 13, 2021.

PS-2 Actions

PS-2a In the event of a significant wildfire in the upslope areas east of the City, the City shall immediately coordinate with relevant federal, state, and local agencies, including but not limited to the USDA, USFS, CAL FIRE, the Orange County Flood Control District, and OCFA to establish and implement, as feasible, a flooding and debris flow prediction and monitoring program. The intent of the program shall be to map and assess the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard. In the event that a flood or debris flow risk is predicted during a subsequent storm event, the City shall implement procedures contained in the Emergency Operations Plan to notify residents and business owners of evacuation orders in affected areas. This action is written and adopted with the understanding that the City of Lake Forest does not possess the resources to implement such a monitoring program independently, and must rely on the expertise and resources of outside agencies.

PS-2b If applicable, mitigate existing non-conforming publicly-owned development to contemporary fire safe standards where feasible, including road standards and vegetative hazards.

PS-2c Continue to require that all new habitable structures be designed in accordance with the most recent California Building and Fire Code with local amendments adopted by the City, including the use of fire sprinklers in residential structures.

PS-2d Participate in Mutual Aid Agreements with neighboring cities and the Orange County Operational Area, described in the 2019 Unified County of Orange and Orange County Operational Area Emergency Operations Plan, as required by the Orange County Fire Authority.

GOAL PS-3 FLOOD HAZARDS

A community that is protected from potential flood hazards.

PS-3 Policies

PS-3.1 **Regulatory Compliance**. Coordinate with local, state, and federal agencies to ensure that the City's regulations related to flood control are in compliance with federal, State, and local standards.

PS-3.2 **FEMA Coordination**. Coordinate with the Federal Emergency Management Agency (FEMA) to ensure that Federal Insurance Rate Maps correctly depict flood hazards in the City.

PS-3.3 **Municipal Code**. Implement the standards and requirements defined in the Municipal Code to reduce flood hazards and address flood-prone areas within Lake Forest.

PS-3.4 **Existing Flood Zones**. Maintain dialogue with the County of Orange regarding regional flood facilities.

PS-3.5 **Changing Conditions**. Coordinate with the Orange County Flood Control District to consider the need to expand the capacity of flood control facilities based on changing flood conditions associated with climate change and extreme weather.

PS-3.6 **Mitigation**. Require that all new development and redevelopment in areas susceptible to flooding incorporate mitigation measures designed to reduce flood hazards.

PS-3.7 **Adequate Infrastructure**. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system is functioning property.

PS-3.8 **Public Awareness**. Promote public education and information dissemination on flooding hazards to help property owners protect their homes and businesses from flood damage.

PS-3 Actions

PS-3a Monitor changes in Federal and State laws and regulations related to local flood protection, including the National Flood Insurance Program and incorporate necessary changes into the Municipal Code, the City's Emergency Operations Plan, and building codes as required and ensure that the City's regulations continue to require that new development within flood hazard zones is consistent with this Safety Element and is required to meet the flood protection requirements of State law, including but not limited to Government Code Sections 65007, 65865.5, 65962 and 66474.5.

PS-3b Continue to disseminate information on flooding, flood control on private property, floodplains, and flood preparedness to the public.

PS-3c Communicate with FEMA annually regarding updates to Flood Insurance Rate Maps and Letter of Map Revisions.

PS-3d Periodically review county, state, and federal flood control best practices and incorporate appropriate standards into the Municipal Code.

PS-3e Work with the Orange County Flood Control District to apply for grants that provide funding for local drainage controls, FEMA's Hazard Mitigation Grant and Flood Mitigation Assistance Programs, and their Pre-disaster Mitigation Program, CalEPA and the CA State Water Resources Control Board offer grans to municipalities throughout California.

GOAL PS-4 HAZARDOUS WASTE AND MATERIALS

A community that is protected from the potential for hazardous waste and materials contamination.

PS-4 Policies

PS-4.1 **Regulations.** Ensure that OCFA continues to enforce the Uniform Fire Code relating to the use of hazardous material and ensure that appropriate regulations are followed and precautions are taken for the type and amount of hazard being created.

PS-4.2 **Cleanup Sites**. Require that developers coordinate with the Orange County Health Care Agency to confirm that hazardous waste cleanup sites located within the City are remediated by the property owner in a manner that keeps the public safe.

PS-4.3 **County Plans**. Utilize the Orange County Hazardous Waste Management Plan to ensure that local regulation and practices are consistent with the policy direction and action programs that the County recommends.

PS-4.4 **Proposed Facilities**. Require appropriate environmental analysis to be conducted for any proposed hazardous waste materials treatment or transfer, in accordance with environmental review requirements.

PS-4.5 **Emergency Response**. Work with OCFA and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.

PS-4.6 **Public Education**. Coordinate with the City's waste service provider(s) and the County of Orange to increase public awareness about proper disposal related to household hazardous waste and inform the Lake Forest community regarding relevant services and programs to address issues related to hazardous waste and materials.

PS-4 Actions

PS-4a As part of the development review process, require projects that result in significant risks associated with hazardous materials to include measures to address the risks and reduce the risks to an acceptable level.

PS-4b Continue to require the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the Orange County Fire Authority.

PS-4c Continue to promote off-site hazardous materials and/or electronic waste drop-off.

GOAL PS-5 Emergency Operations

A community that is highly prepared and equipped to handle emergency situations, in order to minimize loss of life, injury, property damage, and disruption of vital services.

PS-5 Policies

PS-5.1 **Critical Facilities**. Coordinate with service providers to ensure the resilience of critical facilities, lifeline services, and infrastructure, and plan for the use of critical facilities during post-disaster response and recovery.

PS-5.2 **Emergency Preparedness Plans**. Maintain an updated Emergency Operations Plan specific to Lake Forest.[1]

PS-5.3 **Local Coordination**. Coordinate with local key stakeholders (officials, schools, businesses, and organizations) within the community to make them aware of their role in the emergency plan and the necessary requirements in case of emergency.

PS-5.4 **Automatic and Mutual Aid**. Continue to participate in automatic and mutual aid agreements with adjacent service providers to ensure efficient and adequate resources, facilities, and support services during and after emergencies.

PS-5.5 **Communications**. Evaluate the potential to utilize a comprehensive emergency communication system that allows for efficient connection in case of emergency.

PS-5.6 **Emergency Evacuation Routes and Access**. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.

PS-5.7 **Emergency Shelters**. Periodically coordinate with emergency shelter providers to ensure that necessary equipment supplies are available in case of emergency.

PS-5.8 **Community Training Programs.** Continue to support community-based emergency training programs as a valuable asset to the community.

PS-5.9 **Public Awareness**. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible.

PS-5.10 **School Safety**. Coordinate with local schools related to their programs and practices regarding emergency preparedness.

PS-5 Actions

PS-5a Explore grant funding for the preparation of a Local Hazard Mitigation Plan for the City of Lake Forest.

PS-5b Regularly practice implementation of the City's Emergency Operations Plan and update it regularly.

PS-5c Regularly review County and State emergency response procedures that must be coordinated with City procedures.

[1] The Local Hazard Mitigation Plan (LHMP) for the City of Lake Forest 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 LHMP is a separate document adopted into the Safety Element of the General Plan by Resolution No. 2024-36, in compliance with AB 2140. It is available electronically at https:lakeforestca.gov/en/LHMP."

GOAL PS-6 NOISE

A comfortable community environment that is free from excessive noise pollution.

PS-6 Policies

PS-6.1 **Land Use Planning**. Require development and infrastructure projects to be consistent with the maximum allowable noise exposure criteria identified in Table PS-1 to ensure acceptable noise levels for future development.

PS-6.2 **Noise-Sensitive Land Uses**. Ensure appropriate features are incorporated into the design of noise-sensitive land uses to prevent unacceptable noise exposure.

PS-6.3 **Site Design**. Require site planning and project design techniques to minimize noise impacts adjacent to sensitive uses in order to comply with City standards.

PS-6.4 **Noise Control**. Ensure that noise levels do not exceed the limits established in the Municipal Code by incorporating sound-reduction design in new construction and retrofit projects impacted by non-transportation-related noise sources.

PS-6.5 **Roadway Noise**. Encourage nonmotorized transportation alternatives for local trips and the implementation of noise sensitivity measures in the public realm, including traffic-calming road design, lateral separation, natural buffers, and setbacks to decrease excessive motor vehicle noise.

PS-6.6 **Highway Noise**. Continue to coordinate with the California Department of Transportation (Caltrans) and the Transportation Corridor Agencies (TCA) to achieve maximum noise abatement in the design of new highway projects or improvements along I-5 and CA-241.

PS-6.7 **Vehicles and Trucks**. Monitor and enforce speed limits and motor vehicle codes requiring adequate mufflers on all types of vehicles traveling through the City.

PS-6.8 **Commercial Noise**. Require the use of noise attenuation measures, including screening and buffering techniques, for all new commercial development expected to produce excessive noise; in existing cases where the City's noise standards are exceeded, work with Code Enforcement to require compliance.

PS-6.9 **Interjurisdictional Coordination**. Coordinate with neighboring cities to prevent and minimize exceedance of noise standards along the City's boundaries.

PS-6.10 **Airplane Noise**. Maintain communication with John Wayne Airport and other relevant air transportation agencies to minimize the noise-related impacts of air travel on the City.

PS-6 Actions

PS-6a (reserved)

PS-6b To ensure that noise does not adversely affect new sensitive receptors, the City will use land use compatibility noise criteria for various land use types in Table PS-1 when making planning and development decisions. The criteria in Table PS-1 represent the acceptable noise level for new sensitive receptors.

Existing and future noise contours from transportation noise in the City are provided in Figure 1 and Figure 2. The future noise contours in Figure 2 will be used as a guide for land use and development decisions. If the noise level at a project does not exceed the outdoor activity area allowable noise level in Table PS-1, the project is considered compatible with the noise environment.

If the project will exceed the allowable outdoor activity area and interior space noise levels in Table PS-1, the project proponent shall be required to demonstrate (with an acoustical analysis) that the project is designed to attenuate noise to meet the criteria in Table PS-1, and California Building Standards Code, and California Green Building Standards Code (Title 24) interior noise standards. If the project is not designed to meet the noise criteria, noise reduction measures may be recommended in the analysis. If the analysis demonstrates that the noise criteria can be met with implementation of the noise reduction measures, the project may be approved with the noise reduction measures required as conditions of project approval.

PS-6c To ensure that noise from new development does not adversely affect existing sensitive receptors, the City will require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate stationary noise impacts which exceed the criteria identified in the Municipal Code. The studies shall include existing ambient noise measurements, estimates of projected noise levels, and noise reduction measures necessary to ensure compliance with this element.

PS-6d In making a determination of traffic noise impacts under the California Environmental Quality Act (CEQA), a significant impact will occur if ambient noise levels have a substantial increase and the resultant noise levels are in excess of the City's criteria. Generally, a 3 A-weighted decibel (dBA) increase in noise levels is barely perceptible. Therefore, increases in noise levels shall be considered significant when the following occurs:

- When existing noise levels are between 60 dBA and 65 dBA CNEL, a 3 dBA CNEL increase in noise will be considered significant;
- When existing noise levels exceed 65 dBA CNEL, a 1.5 dBA CNEL increase in noise will be considered significant.

PS-6e (reserved)

PS-6f The City should require new residential projects located adjacent to freeways or rail lines to follow applicable Caltrans-adopted vibration criteria to ensure that residential uses are not exposed to vibrations exceeding annoyance thresholds. When required, this shall be accomplished through a vibration study estimating vibration levels at the habitable buildings of the vibration-sensitive use and providing reduction measures necessary to ensure compliance with applicable criteria.

Table PS-1: Land Use Compatibility for Community Noise Environment [5, 6]

Land Use [1]	Outdoor Activity Areas [2, 3] Ldn, dBA	Interior Spaces	
		Ldn, dBA	Leq, dBA [4]
Residential	60	45	–
Motels/Hotels	65	45	–
Mixed-Use	65	45	–
Hospitals, Nursing Homes	60	45	–
Theaters, Auditoriums	–	–	35
Places of Worship	60	–	40
Office Buildings	65	–	45
Schools, Libraries, Museums	70	–	45
Playgrounds, Neighborhood Parks	70	–	-
Industrial	75	–	45
Golf Courses, Water Recreation	70	–	–

1. Where a proposed use is not specifically listed, the use shall comply with the criteria for the most similar use as determined by the City.

2. Outdoor activity areas for residential development are considered to be the private exterior living area of single-family homes and the main common areas where people generally congregate for multi-family and residential components of mixed-use developments. Outdoor activity areas for non-residential developments are the common areas where people generally congregate, including community centers, pool areas, and outside lunch facilities. New multi-family developments and residential components of mixed-use developments with balconies or patios that are exposed to noise that exceeds the outdoor criteria in this table are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

3. In areas where it is not possible for a new project to reduce exterior noise levels to achieve the outdoor activity area criteria using a practical application of the best noise-reduction technology, as determined by a qualified acoustician, an increase of up to 5 dBA Ldn over the outdoor standard will be allowed provided that available exterior noise reduction measures have been implemented and interior noise levels are in compliance with this table

4. Determined for a typical operating hour during periods of use.

5. In accordance with Policy PS-6b, this table shall be used for land use compatibility noise criteria when making planning and development decisions. These criteria represent the acceptable noise level for new sensitive receptors. These criteria are not to be retroactively applied for existing uses. These criteria are also not generally intended for use as CEQA significance thresholds for noise generated by new projects to existing receptors; that purpose is achieved by compliance with Municipal Code standards.

6. Abbreviations: dB = decibel; Leq = equivalent noise level; Ldn = Day-Night Average Level

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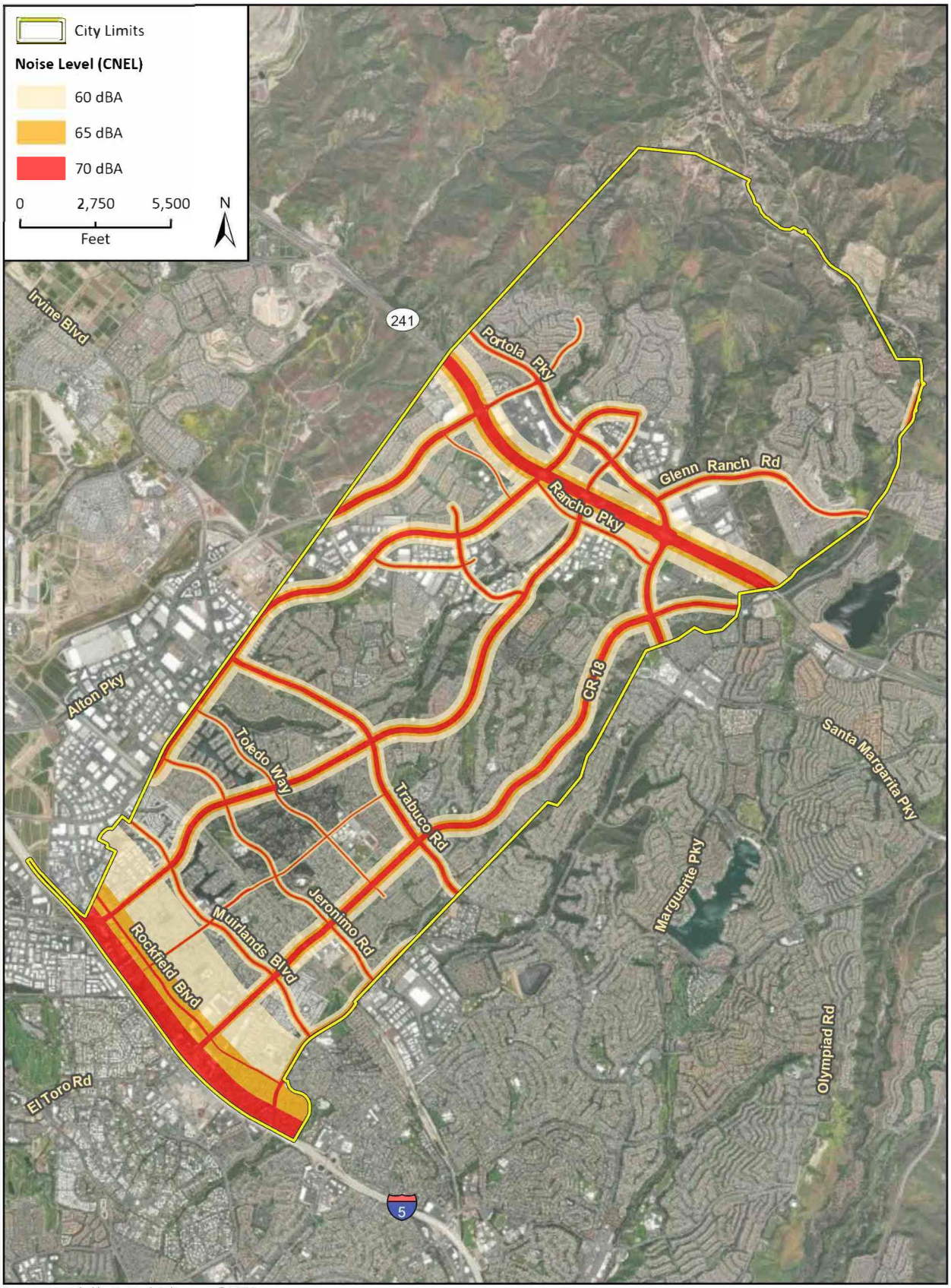

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Fig 1 Existing Noise Contours

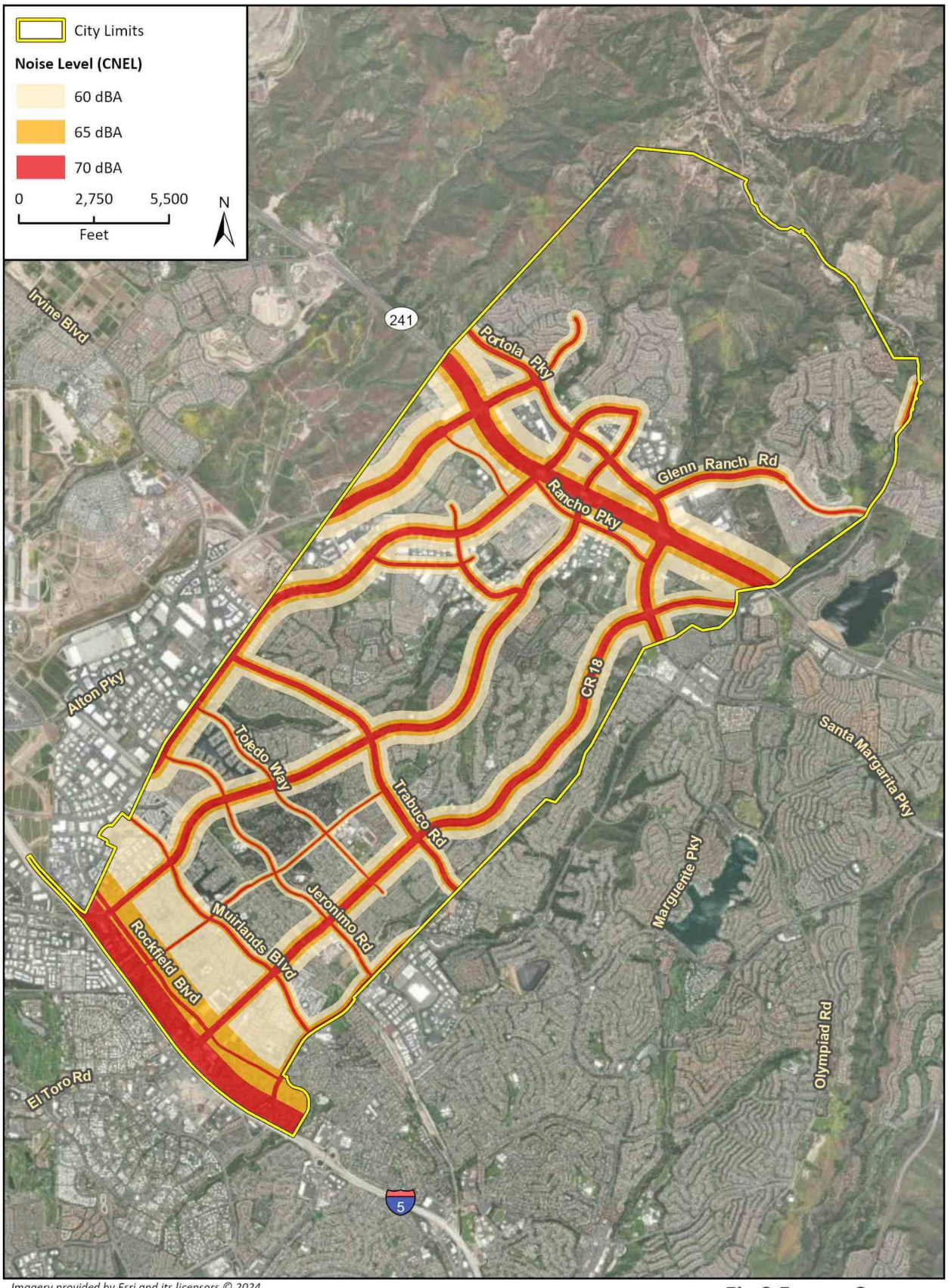

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Fig 2 Future Contours

GOAL PS-7 CLIMATE CHANGE AND RESILIENCY PLANNING

A well-prepared community where risks to life, property, the economy, and the environment resulting from climate change, including extreme weather events, are minimized.

PS-7 Policies

PS-7.1 **Community Preparedness.** Promote a well-prepared City that can effectively overcome natural disasters and scarcity of resources due to climate change.

PS-7.2 **Regional Actions.** Participate in discussions regarding regional actions that reduce impacts from climate change.

PS-7.3 **Community Engagement.** Educate the community regarding potential hazards due to climate change and develop programs and educational material to encourage public readiness.

PS-7.4 **Ecological Recovery.** Coordinate with federal, state, and local agencies to establish ecological recovery programs.

PS-7.5 **Energy Supply.** Promote plans and programs that increase sustainable energy sources.

PS-7.6 **Programs.** Implement necessary actions and programs to improve drought preparation and response for the most vulnerable community members.

PS-7.7 **Cooling Centers.** Designate public buildings, specific private buildings, or institutions with air conditioning as public cooling shelters; extend hours at designated cooling centers during periods of extreme heat or power outage (if the site is supported by a backup generator).

PS-7.8 **Storms.** Continue to provide access to flood protection resources and services (signage, sandbags, etc.) as feasible at designated public facilities during and after extreme weather events.

LOOKING AHEAD

As Lake Forest looks to the future, State law requires the City to consider climate impacts facing California as well as methods to adapt and be resilient to climate change effects. As a result of climate change, Lake Forest may experience more intense and frequent heat waves, drought, and wildfires, and more severe storms and extreme weather events.

Emissions scenarios used in the General Plan and Environmental Impact Report are the same as those used by the Intergovernmental Panel on Climate Change's Fifth Assessment Report and are called Representative Concentration Pathways, or RCPs. There are four RCPs: 2.6, 4.5, 6.0, and 8.5. Each represents a set of possible underlying socioeconomic conditions, policy options, and technological considerations, spanning from a low-end scenario that requires significant emissions reductions resulting in zero global emissions by 2080 (RCP 2.5) to a high-end, "business-as-usual," fossil-fuel-intensive emissions scenario (RCP 8.5). The low-end scenario is most closely aligned with California's ambitious greenhouse gas reduction targets and the aspirational goals of the United Nations Framework Convention on Climate Change 2015 Paris Agreement. Thus far, global emissions continue to follow the business-as-usual trajectory.

PS-7.9 **Special Assistance.** Address the needs of individuals with limited mobility or limited access to transportation for access to safe and comfortable shelter during extreme heat events or other severe weather events.

PS-7.10 **Leadership.** Demonstrate leadership in local climate planning efforts through a range of tangible actions and policies at the municipal operations level.

PS-7.11 **Collaboration.** Collaborate with local, regional, state and/or federal jurisdictions and agencies on climate resiliency and adaptation strategies.

PS-7.12 **Greenhouse Gas Reductions.** Reduce communitywide greenhouse gas emissions locally by actively support regional efforts to reduce greenhouse gases throughout the county.

PS-7.13 **Extreme Heat Vulnerabilities.** Encourage new developments, major remodels, and redevelopments to address urban heat island issues and reduce urban heat island effects for the proposed project site and adjacent properties.

PS-7.14 **Habitat Protection.** Prioritize the protection of vulnerable species and habitat within VHFHSZs that are susceptible to drought and more likely to burn from wildfire, leave the area, or die out from lack of resources.

PS-7.15 **Ongoing Monitoring.** Monitor GHG emissions generated by the community over time for consistency with the established GHG reduction targets, and update the City's community GHG Inventory every five years. In the event that the City determines that ongoing efforts to reduce GHG emissions are not on track to meet the City's adopted GHG reduction targets, the City shall establish and adopt new and/or revised GHG reductions measures that will effectively meet the established GHG reduction targets.

PS-7 Actions

PS-7a Provide information and resources to the public and businesses regarding steps the City is taking to address the issue of climate change.

PS-7b Study the transition to energy-efficient street lights, such as LEDs, for City-owned light facilities.

PS-7c Consider purchasing only electric or alternative-energy vehicles for the City vehicle fleet, as appropriate, based on the intended use of the vehicle.

PS-7d Evaluate the feasibility for government-constructed and/or -operated new development to exceed the CalGreen Tier 1, or successor program, standards.

PS-7e Promote the use of sustainable and carbon-neutral energy sources in new development as directed by the California Green Building Standards Code.

PS-7f Explore using renewable energy and clean generation technologies such as solar, wind, biogas, or fuel cells to power City facilities where appropriate.

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City of Lake Forest

Climate Vulnerability Assessment

December 2021

Prepared by De Novo Planning Group

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A. INTRODUCTION

Communities in California are increasingly vulnerable to the effects of climate change. California's Fourth Climate Change Assessment, conducted in 2018, identifies the Los Angeles Region (which includes Orange County) as especially vulnerable to humans since approximately half the population of the state calls the region home. Climate change refers to changes in conditions that result from increased atmospheric greenhouse gas (GHG) concentrations, which is linked to an increase in average global temperature. The increase in global temperature and GHG result in a series of changes to the global climate, including shifts in: seasonal temperature patterns; altered precipitation timing, volume, and location; sea-level rise; ocean acidification due to increased carbon dioxide (CO2) absorption; and altered wind and storm event frequency, severity, and location). These outcomes interact, and the potential consequences may result not only of the shifts in global climate but also changes to a variety of characteristics that define biophysical systems and human progress.

WHAT IS A CLIMATE VULNERABILITY ASSESSMENT?

The purpose of a Climate Vulnerability Assessment (CVA) is to inform City policies, plans, programs, and guidance to promote effective and integrated action to safeguard from climate change. In addition to increasing global average temperature, climate change has the effect of intensifying the effects of many natural hazards, adding to concerns otherwise addressed in hazard mitigation planning. Climate change results in an increase in variance of climate patterns. The increase in variance means that extreme events may exhibit changes in severity, frequency, and location. The increased variance therefore creates challenges for hazards planning, which previously used historic recurrence rates to predict future events, and now must incorporate changes to frequency, severity, and location due to climate change influences.

ADDRESSING CLIMATE CHANGE

Climate change can be viewed from two scales: global and local. Addressing climate change relies on two high-level approaches at both scales: mitigation and adaptation. Climate change mitigation involves the reduction of GHG emissions, whereas climate adaptation aims to reduce harm from the effects of a changing climate. At the global scale, mitigation appears as less dependency on fossil fuels and a shift towards renewable energy; and at the local scale, mitigation appears as multi-modal and active transportation networks, as an example. At the global scale, climate adaptation can be seen as expanded emergency response teams and climate refugee aid. On the local scale, adaptation can be the preparation taken for inevitable climate-induced emergencies and the spin-off social impacts that could emerge from them. Both approaches at both scales are necessary; however, this document focuses on identifying vulnerabilities and adaptation strategies on the local level within the City of Lake Forest.

REGULATORY FRAMEWORK

There are currently numerous laws and regulations set in place in the State of California that are aimed at reducing the impacts of climate change hazards. For decades, California has continued to adopt, update, and amend Senate and Assembly Bills; create monitoring and mitigation programs; and fund State, regional, and local agencies to promote environmental preservation. A list of relevant bills and documents adopted by the State, region, and City are included in Appendix A. While these documents create general goals and guidelines for the State to achieve and follow, each municipality is unique and therefore can best thrive and meet environmental regulations in its own unique way. The regulatory documents included in Appendix A provide a framework for the direction Lake Forest should be headed, but it is up to the City to implement programs and designs to reduce the effects of climate change.

Assessing Vulnerabilities

The vulnerability that a community experiences as a result of climate change is a product of its biophysical setting in combination with the characteristics of the community, ranging from its built pattern to social, political, and economic characteristics. Put simply, the level of climate vulnerability can be calculated using the following formula:

Exposure + Sensitivity - Adaptive Capacity = Vulnerability

Where:

- **Exposure** refers to the nature and degree to which a system or sub-population is exposed to significant climatic variations.
- **Sensitivity** refers to the degree to which a system or sub-population is affected by climate-related stimuli.
- **Adaptive Capacity** refers to the adaptability of a system or sub-population to adjust to climate change, to moderate potential damages, or to cope with the consequences.

Here is an example:
It is 100 degrees Fahrenheit (exposure) on a playground at a Lake Forest elementary school. Inside a classroom, Cindy is a student with a pre-existing condition (sensitivity) that leaves her at-risk of hyperthermia; however, the classroom is air-conditioned (adaptive capacity), so Cindy is able to continue learning with the rest of the students.

As shown by the example above, many factors are at play when determining the level of climate vulnerability. The California Adaptation Planning Guide identifies five steps in assessing the vulnerability of a community to climate change:

1. **Exposure:** what climate change effects will a community experience?
1. **Sensitivity:** what aspects of a community (people, structures, and functions) will be affected?
2. **Potential impacts:** how will climate change affect the points of sensitivity?
3. **Adaptative capacity:** what is currently being done to address the impacts?
4. **Risk and onset:** how likely are the impacts and how quickly they occur?

Not only do impacts vary, but vulnerability varies across specific areas and groups. For example, future climate changes, especially increases in extreme heat, are expected to disproportionately burden low-income residents and communities of color across the region. The City of Lake Forest is home to people of diverse income groups and backgrounds, not all residents are expected to be equally impacted. While the City does not contain any disadvantaged communities, as defined the state Office of Environmental Health Hazard Assessment, the Environmental Justice Element in the City's Existing Conditions Report further elaborates on the relation between people's health and well-being with the environment.

This CVA describes vulnerabilities in terms of social vulnerabilities and physical vulnerabilities. Social vulnerabilities examine how populations, communities, and social systems are affected by climate change. Physical vulnerabilities examine how infrastructure, critical facilities, and land are affected by climate change.

B. CLIMATE IMPACTS & VULNERABILITY ASSESSMENT

An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate impacts. In addition, a primary objective of this document is to identify geographic areas, populations, and infrastructure in Lake Forest with heightened risk to projected climate impacts. This section first describes the methodology used to obtain climate impact projections. It then highlights each major impact projected in Lake Forest and asks the following questions:

- What is it?
- What is the local exposure?
- Where and when does this impact occur?
    - To what extent will the City be exposed to this impact?
    - Who (or what) is the most vulnerable?
- How does this impact affect or tie into other impacts or hazards?
- How is the City currently addressing this impact?

METHODOLOGY

While the science is highly certain that California (and the world) will continue to warm and experience greater impacts from climate change in the future, specific outcomes are inherently uncertain. Future outcomes vary depending on the level of global GHG emissions. Accordingly, most climate models include a range of possible scenarios based on the level of global GHG emissions.

This document pulls data, and data analysis, from California's Fourth Climate Change Assessment published in 2018. The data discussed in the Assessment, derived from 32 coarse-resolution (~ 100 km) global climate models (GCMs), were bias corrected and downscaled using the Localized Constructed Analogues (LOCA) statistical method. The data cover 1950-2005 for the historical period and 2006-2100 for two future climate projections using medium and high greenhouse gas and aerosol emissions scenarios.

For city-specific predictions, this document uses climate modeling from Cal Adapt, a tool that came about as a key recommendation of the 2009 California Climate Adaptation Strategy and created with oversight from the California Energy Commission and California Strategic Growth Council. Cal Adapt makes two predictions for the period of 2006 to 2100 using medium and high GHG and aerosol emissions scenarios. These scenarios are known as Representative Concentration Pathways (RCP). Each RCP represents a standardized set of assumptions of humanity's trajectory in the coming years. The Medium Emissions Scenario (RCP 4.5) represents a mitigation scenario where global CO2 emissions peak by 2040 and then decline. Statewide, temperature is projected to increase 36-39 °F for this scenario by the end of this century. The High Emissions Scenario (RCP 8.5) represents a scenario where CO2 emissions continue to rise throughout the 21st century. Statewide, temperature is projected to 39-45 °F by the end of this century. Precipitation shows fewer wet days, wetter winters, drier springs and autumns, and an increase in dry years as well as maximum precipitation in a single day. Cal Adapt also specifies that its data is derived from the 32 LOCA downscaled climate projections generated to support California's Fourth Climate Change Assessment; observed historical data is derived from Gridded Observed Meteorological Data; and the data presented are aggregated over all LOCA grid cells that intersect Lake Forest boundaries.

In addition to the range of potential outcomes, climate change can produce a variety of impacts depending on location. California is expected to experience warmer temperatures, increased drought, and more extreme weather events (IPCC, 2007). This is why climate change projections include both drought and increased precipitation leading to flooding. The range of impacts anticipated in Lake Forest are summarized below.

Impacts

Extreme Heat & Weather

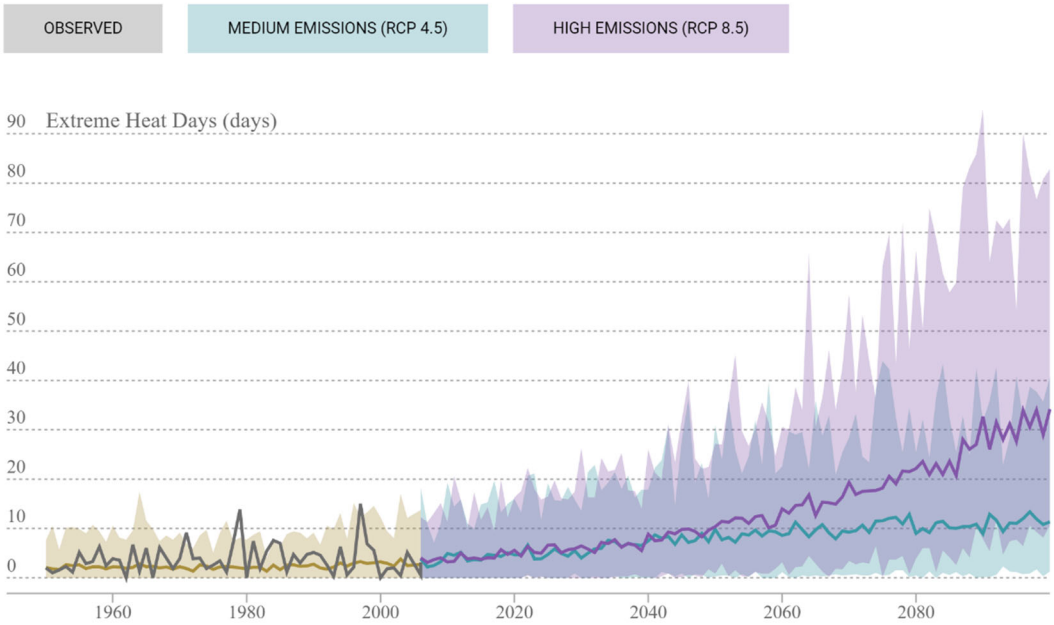
What is it?

Climate change alters seasonal temperature patterns. Effects can include changes in average temperature, the timing of seasons, and the degree of cooling that occurs in the evening. In addition to new seasonal temperature patterns, extreme events such as heat waves are projected to occur more frequently and/or last for longer periods of time. In California, temperature increases are expected to be more pronounced in the summer and in inland areas, and many areas are losing even more of the already moderate winter conditions. Phenomena such as heat waves are projected to increase not only in frequency but in spatial extent (CNRA, 2009). The degree of change experienced partially depends on global GHG emissions and atmospheric concentrations. By 2050, however, temperature increases between 1.8 °F to 5.4 °F are projected under both emissions scenarios examined by the State (CNRA, 2009).

Local Exposure

Temperatures in Lake Forest are relatively mild. In terms of extreme weather, extreme heat is looked at over other extreme weather and storm patterns due to the impact heat has within the City comparatively. Lake Forest is not in a location subject to dangerous storms (hurricane, tornados, blizzards, etc.), tsunamis, or intense winters. Average daily temperatures peak in the afternoon between the months of April through October (climate-data.org). Over the period from 1950 to 2006, the City observed annual average maximum temperatures of 70.9°F (Cal Adapt, 2021). Figure 1 shows the number of days in a year when the daily maximum temperature is above a threshold temperature of 91.4° F. This threshold temperature is the 98th percentile value of historical daily maximum/minimum summer temperatures (from 1961–1990, between April and October) observed within Lake Forest.

Figure 1: Extreme Heat Days, Lake Forest



Source: Cal Adapt, accessed August 24, 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/

As shown in Figure 1, climate change is expected to increase the frequency of extreme heat events per year in Lake Forest. Table 1 supports Figure 1 by showing the average number of days exceeding the 98th percentile summertime (April to October) high-heat threshold in the City. The Baseline (1961 to 1990) modeled historical data shows an average of two days that exceeded the 98th percentile high-heat threshold. By mid-century (2035 to 2064), the number of days exceeding 98th percentile high-heat threshold is expected to quadruple from the Baseline average (from 2 to 8 days) under the Medium Emissions scenario (RCP 4.5) and increase by 8 days (from 2 to 10 days) under the High Emissions (RCP 8.5) scenario. By the end of the century (2070 to 2099), the average number of days is expected to increase by 9 days (from 2 to 11) and 22 days (from 2 to 24) past Baseline for Medium and High Emissions scenarios, respectively.

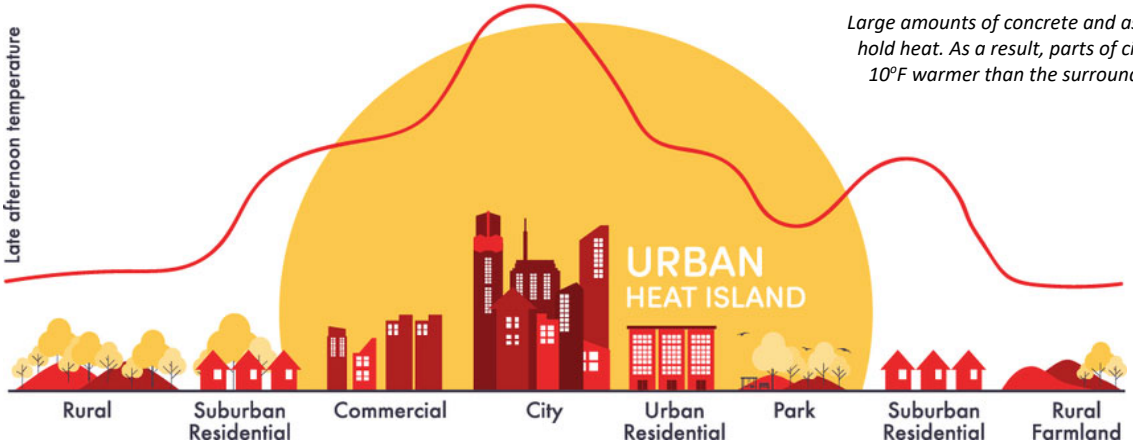
Table 1: Average Number of Days Exceeding 98th Percentile Summertime (April to October) High-Heat Threshold for Lake Forest

Time Period	Scenario	30yr Average	30yr Range	Change from baseline
Baseline (1961-1990)	Modeled Historical	2 days*	1 - 3 days	-
Mid-Century (2035-2064)	Medium Emissions (RCP 4.5)	8 days	5 – 17 days	+ 6 days
	High Emissions (RCP 8.5)	10 days	7 - 23 days	+ 8 days
End of Century (2070-2099)	Medium Emissions (RCP 4.5)	11 days	6 - 30 days	+ 9 days
	High Emissions (RCP 8.5)	24 days	13 – 62 days	+ 22 days

Source: Cal Adapt, accessed August 24, 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/
**Observed 30-year average from 1961 to 1990: 4 days*

Heat waves and extreme heat days are made worse by the urban heat island effect, as demonstrated in Figure 2. Heat islands are urbanized areas that experience higher temperatures than rural areas. This is because an urbanized area's buildings, roads, and other infrastructure absorb and re-emit the sun's heat. Daytime temperatures in urban areas are about 1–7°F higher than temperatures in outlying areas and nighttime temperatures are about 2-5°F higher (EPA, 2021). Because Lake Forest is largely a built-out urban community (with the exception of the Foothill Ranch and Portola Hills open spaces, as depicted in Figure 3), the effects of heat island are pronounced. Figure 3, from the City's 2040 General Plan illustrates where open space is located in the City, and areas of the City that are built-out; the northern portion of the City is largely open space, while the majority of land outside the large open space pocket is developed. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and GHG emissions, heat-related illness and mortality, and water quality. As the community continues to grow and accommodate new development in infill locations, it can be expected that the impacts related to the urban heat island effect will continue.

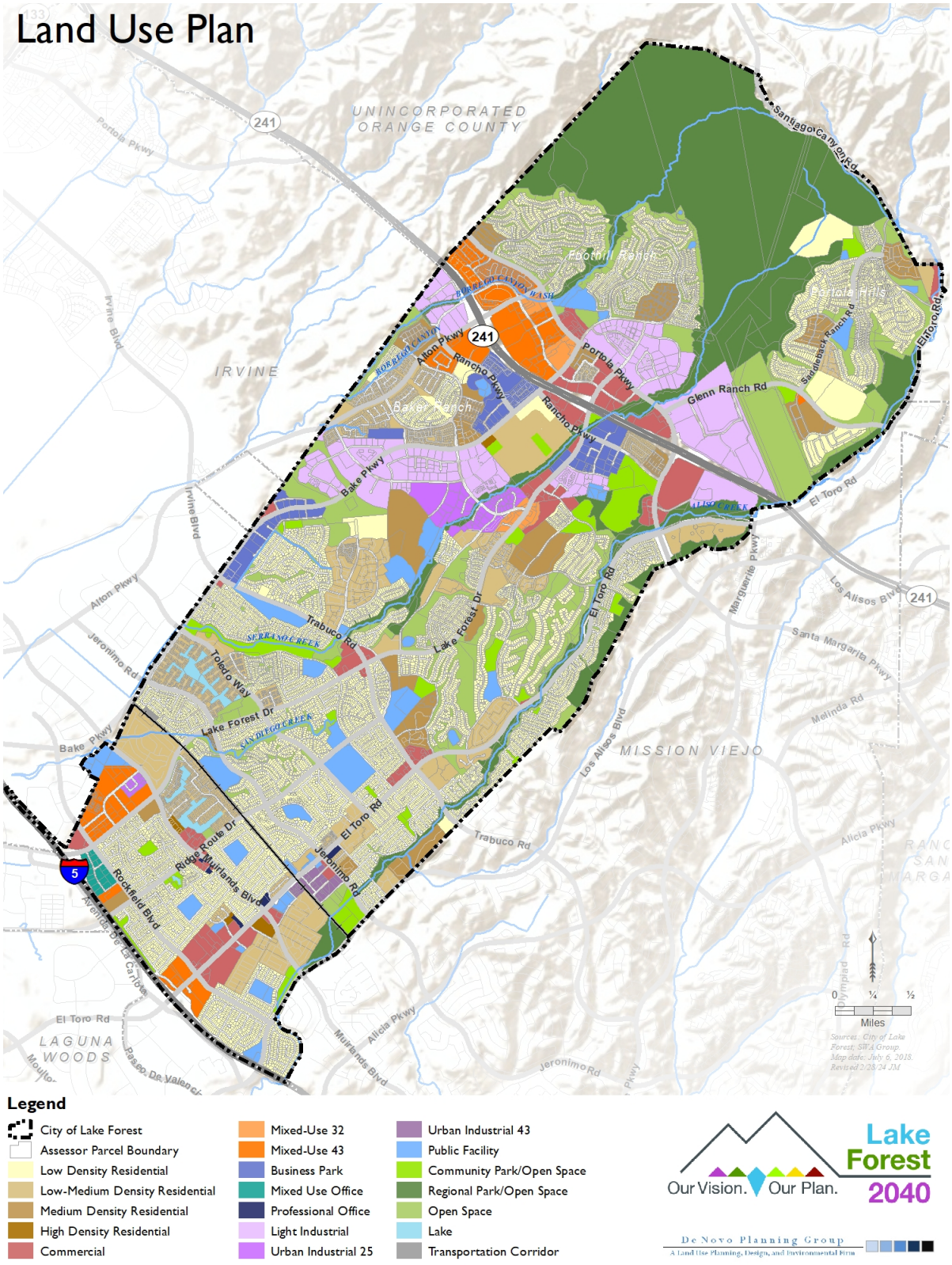
Figure 2: Heat Island Effect



Large amounts of concrete and asphalt absorb and hold heat. As a result, parts of cities can be up to 10°F warmer than the surrounding rural areas

Source: Fuladlu, et al. (2018).

Figure 3: General Plan Land Use Map, Lake Forest



Who is Most Vulnerable?

Everybody can be affected by extreme weather and heat, but certain groups are more sensitive and thus more vulnerable. Social vulnerabilities include people with pre-existing health conditions; people who depend on walking, biking, or transit to get around; children and older adults; and people who work outdoors. Children are at a higher risk for being adversely affected by extreme weather because they spend much of their time outdoors playing or exercising thereby increasing their body temperature already; increased activity in more extreme weather more easily leads to dehydration and skin burning. Older adults are considered highly vulnerable to extreme heat and weather because human body's regulatory and immune systems tend to deteriorate with age and are not as prepared to be resilient against drastic changes. Southern California Association of Governments reports that Lake Forest residents under the age of 18 comprise approximately 21 percent of the population as of 2020; and seniors (65 and above) make up 13 percent of the City population (SCAG, 2020). People experiencing homelessness are also more vulnerable to extreme weather; without safe, consistent, access to shelter, people are exposed to the natural elements more than sheltered counterparts. According to SCAG, there were 112 total individuals in 2019 experiencing homelessness in Lake Forest, with 76 of them classified as unsheltered (SCAG 2020).

Physical vulnerabilities include energy, water, and transportation infrastructure. As temperatures increase, an increased demand on cooling can cause strain on the energy grid and lead to blackouts. The effects of heat on the physical energy grid such as power lines can also cause strain and lead to fires. Parks and open space are also affected because extreme heat can harm vegetation and wildlife, causing the northern regional open space within the City, to be highly vulnerable. Heat can cause transportation delays or malfunctions, or damage transportation infrastructure such as roads.

One way to combat the negative effects of extreme weather and heat, and a way to reduce the impact of urban heat islands, is through incorporation of green space and urban forestry. Open green spaces replace the amount of asphalt and concrete within an area with greenery and foliage, thereby reducing the increased temperatures created by the urban environment. Urban forests can be installed within green spaces or within the urban environment (along sidewalks, road medians, plazas, and in landscaping). Trees provide shade and protect people, sidewalks, buildings and streets, from the sun, thereby decreasing temperatures. The City's General Plan Recreation and Resources Element dedicates specific goals and policies towards promoting and implementing urban forests.

WILDLAND AND URBAN FIRES

WHAT IS IT?

As California is expected to experience increased temperatures and reduced precipitation, there will likely be more frequent and intense wildfires and longer fire seasons. Fires spread more quickly on dry, windy days and move more easily in an uphill direction and in areas with higher-density vegetation. Wildfires are a natural and important part of the ecosystem but can become more intense and dangerous as a result of climate change and land management. Wildfires are unplanned, natural occurring fires and may be caused by lightning, accidental human ignitions, arson, or escaped prescribed fires. Weather is one of the most significant factors in determining the severity of fires; natural fire patterns are driven by conditions such as drought, temperature, precipitation, and wind, and also by changes to vegetation structure and fuel (i.e., biomass) availability. Wildfires pose a great threat to life and property, particularly when they move from forest or rangeland into developed areas.

Climate change is projected to increase the frequency of wildfire events, the extent of burned areas across California, and the duration of wildfire seasons. Wildfire seasons are projected to begin earlier in the spring due to drier and warmer spring conditions on average, potentially requiring longer periods for firefighting services. Greater inter-annual variability in temperature and precipitation may also affect wildfire intensity. For example, multiple wet years can result in larger fuel buildup in landscapes. This may result in increasingly intense and frequent wildfires, if followed by drought years. Wildfire risk will also vary depending on population growth and land use characteristics, including rates of residential expansion and infrastructure into fire prone areas over the next century.

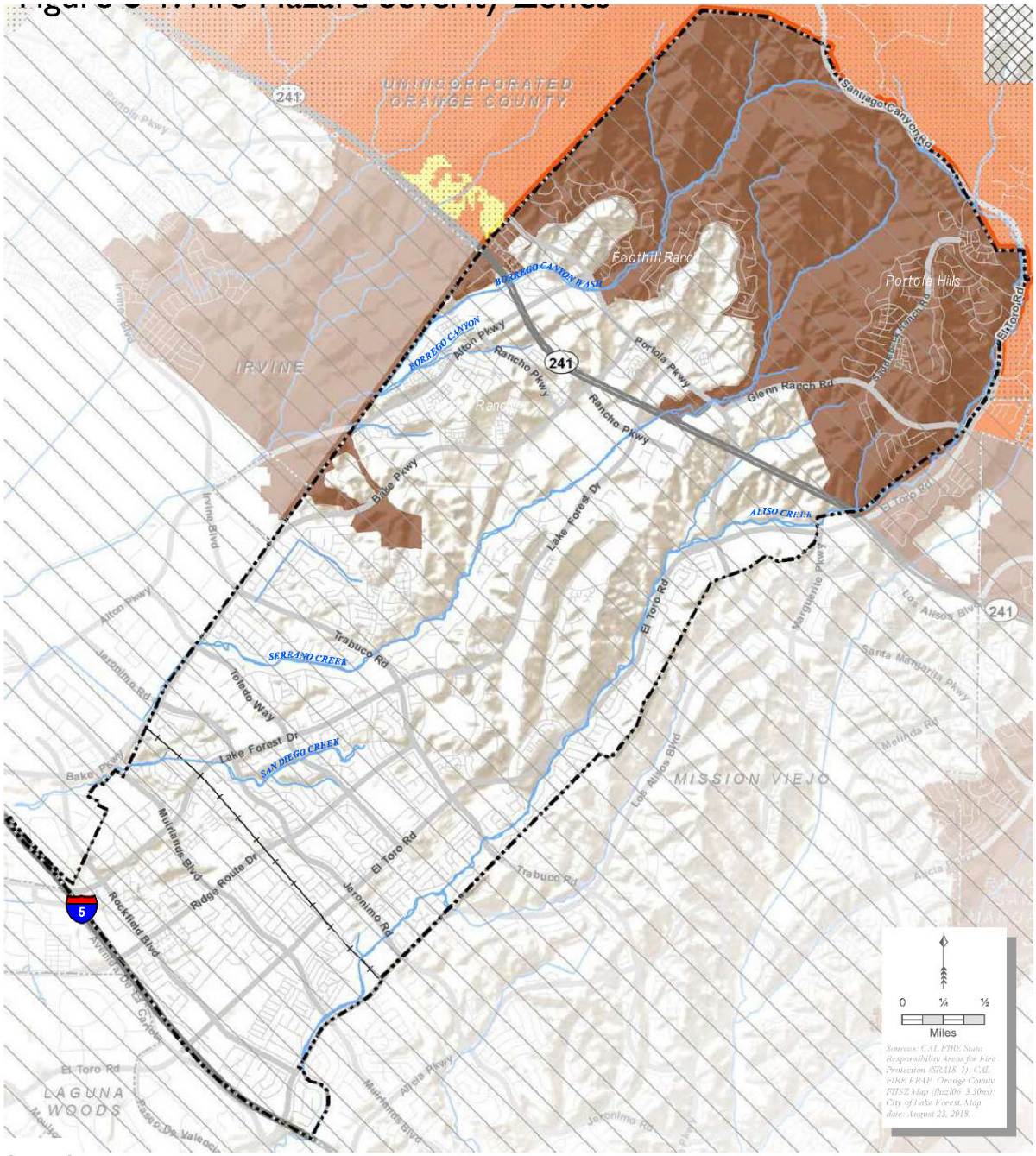
LOCAL EXPOSURE

Fire protection services in the City are provided by Division 5 of the Orange County Fire Authority (OCFA) and served by Battalion 4. There are 3 fire stations within city limits: Station 19, 42, and 54. The State has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones identified within any Local Responsibility Areas. The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards.[1] Figure 4 shows Fire Hazard Severity Zones near Lake Forest while Figure 5 depicts Fire Threat to People in the area. Local Responsibility Areas (LRA) covers all of the City of Lake Forest, which is served by the OCFA. Most of the Foothill Ranch and Portola Hills areas are within the Very High Fire Hazard Severity Zone; fire stations 42 and 54 are also located within this FHSZ. State Responsibility Areas (SRA) are found to the north of the City in unincorporated areas of the county. Some of these areas are within the Very High Fire Hazard Severity Zone in an SRA. Most of the area north of Trabuco Road is in an area that is considered either a very high or extremely high Fire Threat to People (ECR: Chapter 8, Pages 8-13).

Emergency medical transportation services in the City and the adjacent unincorporated Modjeska Canyon Area and Upper Trabuco/Cook Canyon Areas are provided by contract ambulance services. The built-out nature of the majority of the City makes the urban environment less vulnerable to the threat of wildfire, but still susceptible to the products of wildfire such as poor air quality. Climate change further increases the risk of urban fires originating in Lake Forest or in surrounding areas. Fires in other locations could cause reduced air quality, putting the health of sensitive populations at risk.

[1] Page 8-12 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

Figure 4: Fire Hazard Severity Zones, Lake Forest



Legend

City of Lake Forest

Responsibility Areas
- Federal
- Local
- State

Fire Hazard Severity Zones

In Local Responsibility Areas
- Very High

In State Responsibility Areas
- Moderate
- High
- Very High

Lake Forest 2040 — Our Vision. Our Plan.

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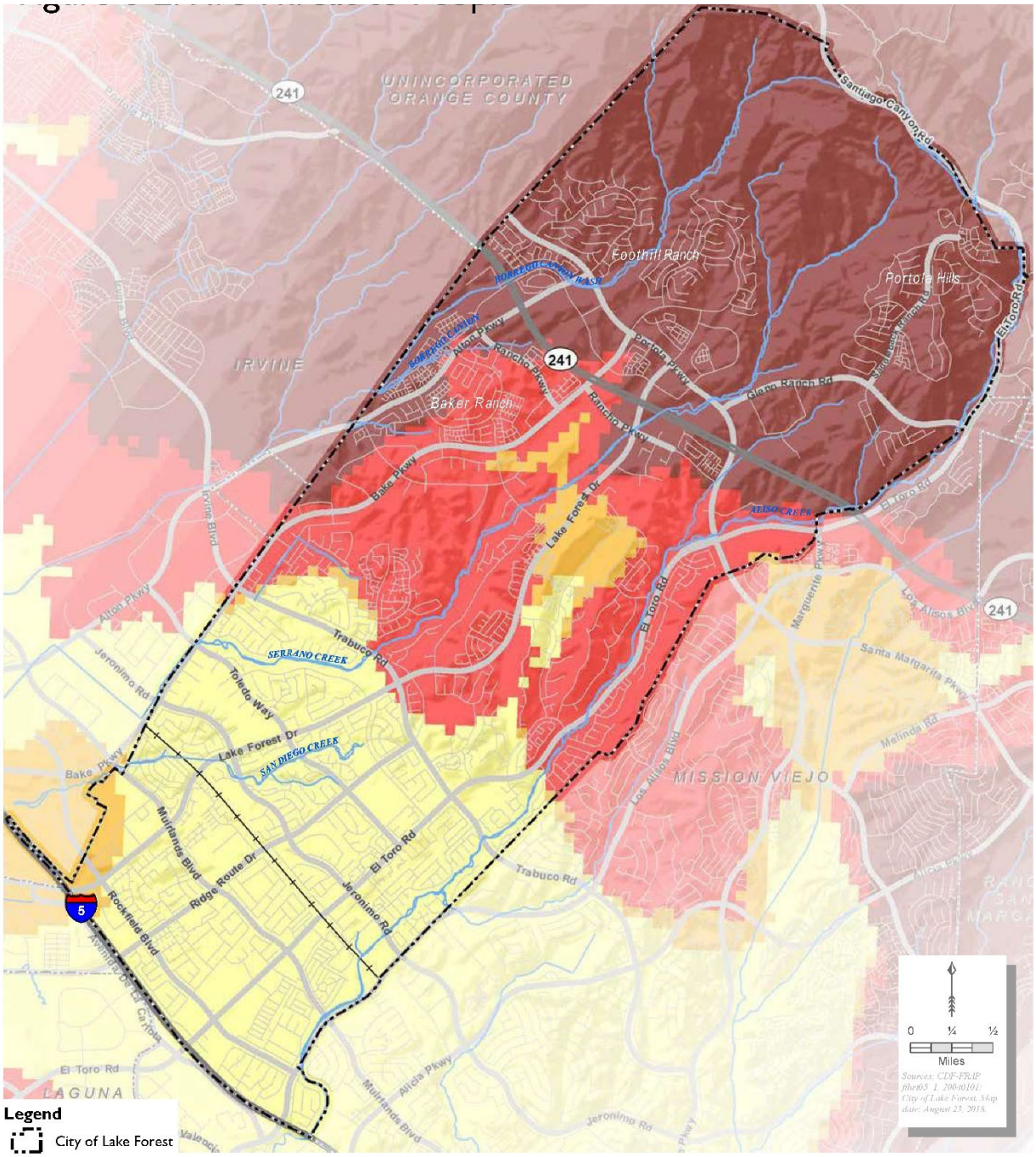
Figure 5: Fire Threat to People



Source: Lake Forest Existing Conditions Report (2018), Chapter 8 Hazards, Safety, and Noise, Figure 8-2.

Table 2 projects the average annual area burned over the next century in Lake Forest. As shown, the City is expected to burn approximately two fewer acres during the middle of the century (2035-2064) compared to the Baseline acreage; whereas the end of century (2070-2099) is predicted to burn up to an additional four acres of land compared to the Baseline, in the High Emissions scenario (in the Medium Emissions scenario, the burn rate is expected to stay consistent with the Baseline average).

Table 2: Average Annual Area Burned, Lake Forest

Time Period	Scenario	30yr Average	30yr Range	Change from baseline
Baseline (1961-1990)	Medium Emissions (RCP 4.5)	65.1 acres	62.3 – 67.4 acres	--
	High Emissions (RCP 8.5)	65.7 acres	59.7 – 72.4 acres	--
Mid-Century (2035-2064)	Medium Emissions (RCP 4.5)	63.2 acres	59.0 – 67.4 acres	-1.9 acres
	High Emissions (RCP 8.5)	63.2 acres	53.5 – 70.8 acres	-2.5 acres
End of Century (2070-2099)	Medium Emissions (RCP 4.5)	65.2 acres	58.7 – 71.2 acres	+0.1 acres
	High Emissions (RCP 8.5)	61.4 acres	54.1 – 658.7acres	+4.3 acres

Source: Cal Adapt, accessed August 24, 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/

Who is Most Vulnerable?

Especially vulnerable people include people with pre-existing health conditions, such as asthma, who are more sensitive to hazardous air. The percentage of people diagnosed with asthma in Lake Forest is similar to the rates in both the region and Orange County; 11 percent of Lake Forest children and 14 percent of Lake Forest adults have been diagnosed at some point in their lives.[2] Additionally, households without access to a car may have difficulty running errands, going outside, or evacuating when the air is hazardous. Individuals with physical disabilities or who live in isolation may have difficulty evacuating. Vulnerable infrastructure includes energy infrastructure (fires in other areas could cause damage to power plants or power lines causing blackouts), communications, water (water quality reduced due to ash, etc.) Natural habitats and plants and animals are extremely vulnerable to wildfires; while Lake Forest and the surrounding area are almost completely built out, open spaces and urban forests provide homes to plant and animal species, which are susceptible to fire hazards.

Vulnerable populations also include those that live near the Fire Hazard Severity Zones (Foothill Ranch and Portola Hills) and within the Very High and Extreme Fire Threat Zones, as depicted in Figure 5. Lake Forest's emergency preparedness services include the City's Community Emergency Preparedness Academy (CEPA), Community Emergency Response Team (CERT), Earthquake Preparedness, and Ready OC. Ready OC is Orange County's emergency preparedness resource program for the entire county.

[2] Page 6-10 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

FLOODING

WHAT IS IT?

Increased flooding occurs when rain falls over a shorter period, even if there is less overall rain. Vegetated and pervious surfaces such as grass and soil do not have enough time to absorb the rainfall, overwhelming stormwater infrastructure capacity. In combination, changes in temperature and precipitation may exacerbate impacts. Heavy stormwater runoff can contaminate the surrounding bodies of water with environmentally and biologically harmful bacteria (Cal EMA, 2012). Intense rainstorms could require evacuation and temporary or permanent displacement of people and result in property damage or loss.

LOCAL EXPOSURE

Changes in precipitation are not expected to have major effects on Lake Forest; however, increased incidences and volume of rainfall could lead to flooding. Much of Lake Forest has steep topography and a minimal risk of flooding. However, there are a few low-lying areas of the City where storm water can percolate into the ground. Nevertheless, the steep topography and large amounts of paved area reduce infiltration and increase surface runoff, which can increase the risk of localized flooding. Localized flooding may occur in low spots or where infrastructure is unable to accommodate peak flows during a storm event. In most cases, water dissipates quickly after heavy rain ceases.[3] The City's stormwater control systems are currently owned and operated by the City of Lake Forest. Until recently, the Orange County Flood Control District owned and operated the stormwater control system within the City. The City took over control of all facilities recently and is currently in the process of tracking, mapping, and analyzing the facilities. Currently, the City does not have its own mapping of the stormwater facilities; however, they are currently mapped by the Orange County Flood Control District.[4]

Only a small area within Lake Forest is located within a mapped portion of either the 100-year and 500- year FEMA flood zones. The areas documented to be subject to 100-year and 500-year flooding within Lake Forest are located along Aliso Creek, Serrano Creek, Borrego Canyon Wash, San Diego Creek, and the lakes. Risk of flooding along these areas is limited, since flooding within this location would be likely to only affect a small area outside of the normal creek bed. The largest area of Lake Forest within the 100-year and 500-year FEMA flood zones is along the Aliso Creek bed and bike trail near Heroes Park along the eastern edge of the City. Nevertheless, areas within FEMA flood zones within Lake Forest are largely undeveloped, and therefore damage is expected to be relatively limited within these areas during a large-scale flooding event.[5]

Lake Forest falls within the jurisdiction of two Regional Water Quality Control Boards: the Santa Ana and San Diego RWQCBs.[6] The Santa Ana Region covers parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. The northwestern portion of the City of Lake Forest, approximately north of El Toro Road, is located within this region. The Santa Ana Region (Region 8) includes the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other small drainage areas. The southeastern portions of the City fall under the requirements of the San Diego RWQCB (Region 9), the region south of El Toro Road.

The City of Lake Forest is also a participant in the National Flood Insurance Program (NFIP). Communities participating in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flooding risks.[7] This program helps incentivize people to develop less on historic floodplains.

[3] Page 8-15 of the Existing Conditions Report prepared by De Novo Planning Group, 2018
[4] Page 7-14 of the Existing Conditions Report prepared by De Novo Planning Group, 2018
[5] Page 8-16 of the Existing Conditions Report prepared by De Novo Planning Group, 2018
[6] Page 7-7 of the Existing Conditions Report prepared by De Novo Planning Group, 2018
[7] Page 9-13 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

While California does not see the average annual precipitation changing significantly in the next 50-75 years, precipitation will likely be delivered in more intense storms and within a shorter wet season (Cal Adapt). As a built-out, urbanized area, Lake Forest is especially vulnerable to flooding due to the large area of impervious surfaces such as asphalt and concrete which block rainwater from absorbing into the ground, causing runoff. Table 3 demonstrates the predicted increase in one-day rainfall in Lake Forest over the next century. The Baseline average is approximately 1.5 inches in one day. During the middle of the century (2035-2064), the average rainfall within a day is expected to increase by just under 0.05 of an inch under the Medium Emissions scenario, and approximately 0.08 inches under the High Emissions scenario. By the end of century model (2070-2099) rain is predicted to fall an additional 0.13 of an inch under the Medium Emissions scenario, and an additional 0.15 inches in one day under the High Emissions scenario. While these may not seem like exceptional increases on their own, the data must be observed on a larger scale and compounded with other climate change phenomena to predict the impact on the City, and on the region.

Table 3: Maximum One-Day Precipitation, Lake Forest

Time Period	Scenario	30yr Average	30yr Range	Change from baseline
Baseline (1961-1990)	Modeled Historical	1.564* inches	1.351 – 1.770 inches	-
Mid-Century (2035-2064)	Medium Emissions (RCP 4.5)	1.609 inches	1.352 – 1.917 inches	+0.045 inches
	High Emissions (RCP 8.5)	1.652 inches	1.430 – 1.981 inches	+0.088 inches
End of Century (2070-2099)	Medium Emissions (RCP 4.5)	1.696 inches	1.321 – 2.030 inches	+0.132 inches
	High Emissions (RCP 8.5)	1.715 inches	1.190 - 2.125 inches	+0.151 inches

Source: Cal Adapt, accessed AUGUST 24, 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/
** Observed 30-year average from 1961 to 1990: 1.459 inches*

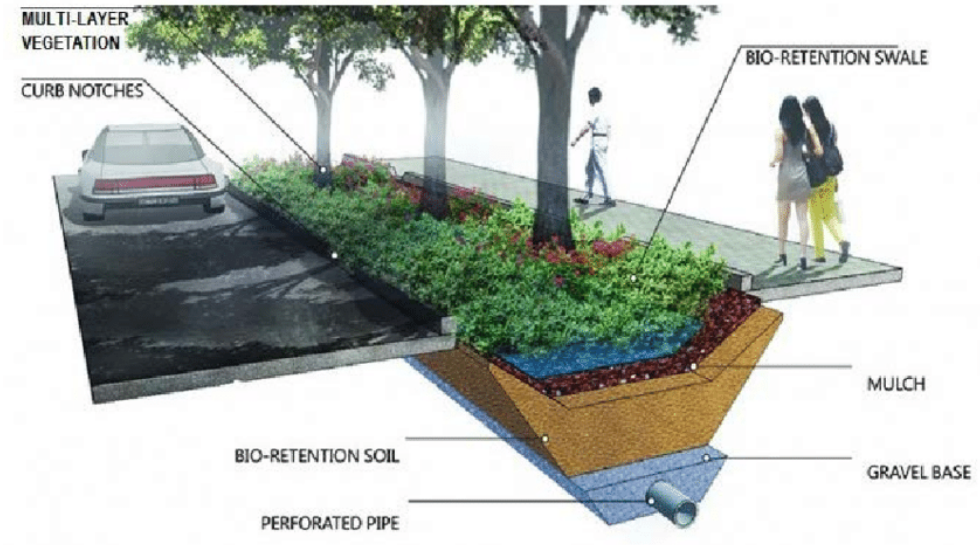
Agencies, such as the Orange County Flood District, have created plans that prepare the County, and subsequently the City, for potential flooding hazards. The Orange County Drainage Area Management Plan aims to evaluate the impacts of urban stormwater discharge on receiving waters and communities. The DAMP is the principal policy, guidance and reporting document for the Orange County NPDES Stormwater Program that is implemented within each Permittee's jurisdiction as documented within its Local Implementation Plan (LIP); the City of Lake Forest adopted its LIP in 2010.

Who is Most Vulnerable?

Flooding impacts generally are *not* linked to specific populations, such as seniors, children, or individuals with disabilities. However, older housing inventories are sometimes located in low-lying, more flood-prone areas near where the community was originally established. In such areas, there may tend to be greater concentrations of renters, elderly, and communities of color, and such neighborhoods are likely to be more affected by historical flooding than more recently developed communities. According to SCAG, the highest share of Lake Forest's housing units were built between 1970-1979, approximately 33 percent of housing units (SCAG, 2020). An additional 30 percent of homes were constructed between 1980-1989, indicating that over 60 percent of all housing units currently in Lake Forest are older than 30 years, causing the units to be more susceptible to extreme conditions, such as flooding (SCAG, 2020). Especially vulnerable infrastructure is that which is located in low-lying, more flood-prone areas and includes transportation (especially roadways and tunnels); public and community centers; and older buildings and roadways.

Within the last 15 years, Lake Forest has experienced significant growth. A large amount of this growth is through development of most of the remaining "greenfield" areas within its sphere of influence and annexations of several large contagious communities such as Foothill Ranch and Portola Hills.[8] The removal of pervious surface and green space and replacement with built up impervious materials increasing the chances of flooding as the local environment's ability and capacity to hold water decreases. People and homes within these areas are at a higher risk for flooding incidents than residents living in more level, already built out areas. One way potential flooding hazards can be decreased is by expanding the amount of pervious surfaces within City limits. This can look like more greenery and landscaping throughout the urban, built-up environment, or implementation of strategic landscaping tools such as bioswales and catch basins. Bioswales, as depicted in Figure 6, allow for greater volumes of water to be held at once, and slowly drain and percolate the water at a rate that the water systems and natural environment can handle. Lake Forest's General Plan Recreation and Resources, Public Safety, and Public Facility Elements emphasizes goals and policies dedicated to preventing and mitigating flood hazards and promoting public and environmental safety. The City can also look to the County's Drainage Area Management Plan to help prepare for and mitigate the potential hazards that come with flooding.

Figure 6: Flood Control, Bioswale



Source: Green Earth Operations

[8] Page 3-1 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

DROUGHT

WHAT IS IT?

California's highly variable climate is susceptible to prolonged dry spells. A warming climate will compound drought impacts, as evidenced during recent precipitation deficits in the 2000's Southwest drought (Colorado River basin), and during the 2012-2015 drought in California and neighboring states (Pierce, et al, 2018). Furthermore, recent research suggests that extended drought occurrence ("mega-drought") could become more pervasive in future decades (Pierce, et al, 2018).

LOCAL EXPOSURE

California has experienced prolonged droughts off and on throughout the decades, including in Southern California. The Irvine Ranch Water District (IRWD) supplies potable water to the majority of Lake Forest; the remaining Lake Forest residents are served by the El Toro Water District (ETWD) of the Trabuco Canyon Water District (TCWD).

IRWD is one of the largest water districts in Orange County, serving the entire City of Irvine and portions of Tustin, Santa Ana, Costa Mesa, Newport Beach, and Lake Forest; an area of approximately 132 square miles. IRWD is a member agency of the Municipal Water District of Orange County (MWDOC), which is a wholesale importer and member agency of the Metropolitan Water District (MWD). IRWD receives its imported water supplies through MWDOC. According to the IRWD Urban Water Management Plan, the IRWD began developing local water supplies to reduce dependence on costly imported water, and now produces drinking water from 26 groundwater wells throughout the service area; IRWD's potable water supply inside the borders of the City consists of almost 250 miles of potable water lines. Approximately one-half of IRWD's water supplies comes from these local groundwater wells in the Orange County Groundwater Basin. A small portion of the City, the Portola Hills community, is located within the TCWD service area boundary, yet is provided water by IRWD. The majority of IRWD's potable water is a blend of Colorado River water and State Water Project water that is treated at the MWD Diemer Filtration Plant (DFP) located north of Yorba Linda.

ETWD provides service to residents in the southeast corner of the City. The district area is almost entirely built out with residential communities and serves the entire City of Laguna Woods as well as portions of Aliso Viejo, Laguna Hills, Laguna Woods, Lake Forest, and Mission Viejo. Like IRWD, ETWD is a member agency of the MWDOC. ETWD receives all its imported water supply through MWDOC. ETWD supplies water through approximately 50 miles of potable water lines within the City boundary. ETWD relies completely on imported treated water from MWDOC to meet 100 percent of potable water demands.

A portion of the City of Lake Forest's Portola Hills community is the only area that lies within TCWD boundaries. However, under terms of an agreement with IRWD, IRWD supplies water to the 532 connections.[9]

Table 4 shows the differences in maximum dry spell lengths in Lake Forest from Baseline measurements to predicted future variations. The Baseline scenario states that the 30-year average length of a dry spell was approximately 136 days. Dry spells are predicted to increase by 7-8 days over Baseline conditions by the middle of the century (2035-2064), and between 8-16 days over Baseline conditions by the end of the century (2070-2099).

[9] Pages 7-4 through 7-5 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

Table 4:Maximum Length of Dry Spell, Lake Forest

Time Period	Scenario	30yr Average	30yr Range	Change from baseline
Baseline (1961-1990)	Modeled Historical	136 days*	122 - 150 days	-
Mid-Century (2035-2064)	Medium Emissions (RCP 4.5)	143 days	121 - 166 days	+7 days
	High Emissions (RCP 8.5)	144 days	120 - 175 days	+8 days
End of Century (2070-2099)	Medium Emissions (RCP 4.5)	144 days	119 - 170 days	+8 days
	High Emissions (RCP 8.5)	152 days	108 - 202 days	+16 days

Source: Cal Adapt, accessed August 24, 2021. https://cal-adapt.org/tools/local-climate-change-snapshot/
** Observed 30-year average from 1961 to 1990: 141 days*

Who is Most Vulnerable?

Extreme drought (and heat) decreases soil moisture and increase plant mortality; these changes in temperature and precipitation regimes will have adverse impacts on the vegetation and foliage in the entire southern California region. Plant die-offs cause a domino effect by reducing available shade and evaporative cooling, thereby raising surrounding temperatures and reducing the thermal comfort of pedestrians.

A vulnerable group highly affected by droughts are farmers and agricultural industries. While there isn't an established agricultural hub in Lake Forest, the broader agricultural industry in the Southern California and Central Valley region will likely be adversely impacted by increased droughts, which will have reverberated impacts on the City. More frequent occurrences of extreme events similar to the 2011-2016 drought could significantly decrease groundwater recharge, which is essential for the livelihood of the region.

People with pre-existing respiratory conditions are also extremely vulnerable: in the absence of rainfall during prolonged periods of drought, the region could experience increased concentrations of resuspended road particulates (dust), which have adverse respiratory impacts (Hall, et al. 2018).

Especially vulnerable infrastructure includes water importing systems. For Lake Forest this includes all water infrastructure within the IRWD and ETWD, and greater Orange County area, as all systems are interconnected through MWDOC. The MWDOC serves more than 2.3 million Orange County, residents through 28 cities, water districts, and investor-owned utilities or MAs. MWDOC's service area covers all of Orange County except the cities of Anaheim, Fullerton, and Santa Ana (Water Resources Planner, 2021). Even if only certain regions were to experience drought, the interlinked municipalities would be adversely affected.

To help protect vulnerable populations and infrastructure, Lake Forest can enact varying water restrictions. Some water restrictions in place in other cities and counties in California include personal and individual restrictions and limitations or increased cost. Other restrictions are designed to limit commercial and industrial water use and water waste. Potential drought hazards can also be curbed through proactive management; the Orange County Groundwater Management Plan monitors water supply and provides direction towards proper management of recharge facilities.

LIQUEFACTION

WHAT IS IT?

Liquefaction is caused by a shock or strain from an earthquake and involves the sudden loss of soil strength and cohesion and the temporary transformation of soil into a fluid mass. Liquefaction occurring beneath buildings can lead to major damage.

LOCAL EXPOSURE

Lake Forest is located in a seismically active area that has historically been affected by moderate to occasionally high levels of ground motion. According to the California Department of Conservation, there are three zones that run generally parallel to each other within the City that are considered liquefaction zones: El Toro Road, Serrano Creek, and the Borrego Creek Wash, as depicted in Figure 7. These areas contain a wide range of uses: industrial, open space, business park, public facilities, commercial, and residential uses; with residential areas being the largest land use.

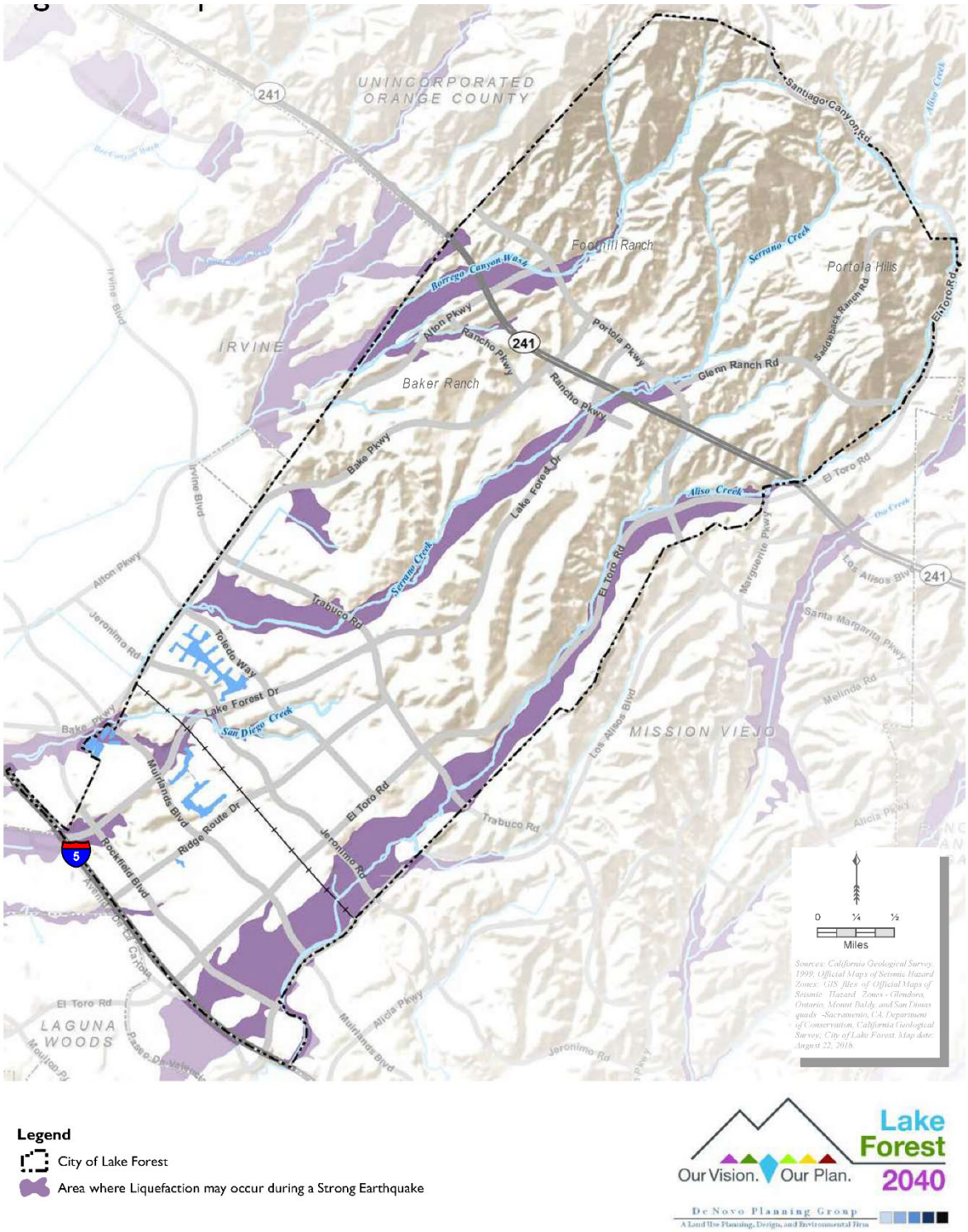
WHO IS MOST VULNERABLE?

In terms of climate change, no one is more susceptible to liquefaction than others. Older structures within the City are vulnerable to loss by liquefaction as they may not have been constructed or reinforced to meet earthquake standards. As discussed, over 60 percent of the City's residential housing units are over 30 years old, creating a higher chance of susceptibility to extreme hazards, such as liquefaction. The most vulnerable areas are those in a liquefaction zone thereby putting the land uses area along El Toro Road, Serrano Creek, and Borrego Creek Wash at risk. The people that are specifically vulnerable within this area are the ones living in these residential neighborhoods; Lake Forest has low, medium, and high-density residential areas within these liquefaction zones.

Pipeline transportation infrastructure (water, gas, electricity, sanitation) is also highly vulnerable to ground motion due to the majority of it being buried underground. Seismic activity, liquefaction, or land subsidence could damage one pipe, or area, and have a cascading effect throughout the City and region. A large earthquake, or liquefaction incident could also trigger a number of other hazards that could be exacerbated due to climate change. For example, if a strong liquefaction incident were to occur, it could rupture pipelines or electricity poles; with temperatures expected to rise and the climate expected to be more drought prone, knocked over electricity poles could more easily cause an urban fire.

In any such cases, emergency response teams would be required to dimmish the impacts. Lake Forest has city-specific response teams, and is apart of county-wide emergency programs as well. The Orange County Emergency Operations Plan discusses actions and operations to take depending on the hazard threat; the hazards range from manmade harms to natural disasters.

Figure 7: Liquefaction Seismic Hazard Zones, Lake Forest



Source: Lake Forest Existing Conditions Report (2018), Chapter 9 Conservation, Figure 9-5 Liquefaction Seismic Hazard Zones

HAZARDOUS MATERIALS

What Is It?

Hazardous materials are defined as a detrimental substance, including but not limited to pesticides, herbicides, toxic metals and chemicals, liquefied natural gas, explosives, volatile chemicals, and nuclear fuels. All materials whether they be the intentional product, or resulting by-product, that can cause harm to people's individual health, public health, or environmental health are all considered toxic and must be handled and contained safely. It is imperative to note environmental justice issues here as they are related to potential health impacts associated with land use decisions, including enforcement actions to reduce the adverse health effects of hazardous materials, industrial activity and other undesirable land uses, on residents regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location.

Local Exposure

According to the California Department of Toxic Substances Control EnviroStar Tool, the City of Lake Forest has three active hazardous waste and substances sites: Prothero Enterprises (23512-23532 El Toro Road), Former Mercury Cleaners (23804 Mercury Road), and Lake Forest Town Center/ Dry Cleaner (22641 Lake Forest Drive). Prothero Enterprises, which is no longer the store at the site location, is located within a commercial zone, but is surrounded by low-medium and high-density housing units; it is registered as a voluntary cleanup site and the County is responsible for oversight. Former Mercury Cleaners is within a commercial district, thereby not putting any residents at direct risk. Lake Forest Town Center is also located within a commercial and industrial, area, so the potential for adversely effecting sensitive populations or areas (residential areas) is lower; however, directly north of the hazardous site (across Muirlands Boulevard) is a residential neighborhood.

According to the State Water Board's List of Leaking Underground Storage Tank Sites, Lake Forest contains 42 cleanup sites. Of those 42, only four sites are still open: Arco #3013, Mobil #18-378, and USA Station #824 are open for site assessment, while the Beacon Bay Auto Wash #12 site is open for remediation. According to the City Land Use Map, the Arco #3013 and USA Station #824 sites are located within commercial areas; and the Beacon Bay Auto Wash and Mobil #18-378 are located within Mixed-Use areas (Mixed-Use 43). Mixed Use 43 land use allows for commercial and services uses.

Who is Most Vulnerable?

The most vulnerable populations to hazardous waste and materials are people and communities living closest to toxic sites. For Lake Forest, these are the communities closest to and within Prothero Enterprises, Former Mercury Cleaners, and the Lake Forest Town Center.

Local habitats, animals, and plants are extremely vulnerable if natural resources become contaminated by hazardous materials. Polluted water and air sources have an expanding impact as the species living in the immediate contaminated area either move themselves or are consumed by others and moved throughout the ecosystem then.

C. KEY FINDINGS

The key findings are summarized below to increase the City's adaptive capacity.

- Climate change has the potential to increase the severity of various natural hazards and impacts in the City of Lake Forest.
- Wildland and urban fires represent the impact most likely to effect Lake Forest as a result of climate change. While most likely to ignite within the CalFire FHSZs, Foothill Ranch, and Portola Hills, the effects of wildfire can adversely affect larger areas, cascading out towards the entirety of Lake Forest and surrounding cities, with smoke, ash, and poor air quality.
- The most vulnerable populations are those living in or adjacent to Very High FHSZs within the City. Other vulnerable populations include senior citizens, people with pre-existing health conditions, and homeless people.
- The most vulnerable natural areas are environments (and wildlife within these environments) in the Whiting Ranch Wilderness Park (Foothill Ranch and Portola Hills Very High FHSZs). This Park contains the most open space and natural landscape in the City and contains high amounts of- often dry- foliage that is highly susceptible to fires. As prolonged dry spells are predicted to lengthen, plants, animals, and habitats that receive less and less water are more likely to burn from wildfire, leave the area, or die out from lack of resources.
- The most vulnerable infrastructure are power and energy infrastructure, as well as homes (and businesses) bordering the Very High FHSZs. Extreme weather and heat conditions can increase the risk of fires, which can lead to the destruction of energy infrastructure such as power plants and power lines that are located in more remote (and more fire prone) areas. Since energy grids are interconnected and provide energy throughout the region, large parts of the Southern California population are expected to be impacted by distant fires or power outages. Closely located infrastructure, i.e. neighborhood homes bordering FHSZs can suffer brutal impacts, and possibly even total destruction.

D. REFERENCES

Cal Adapt, *Local Climate Change Snapshot for Lake Forest, California*, Retrieved November 23, 2021, https://cal-adapt.org/tools/local-climate-change-snapshot/

California Department of Toxic Substances Control (2021). EnviroStar Tool. Retrieved August 24, 2021, https://www.envirostor.dtsc.ca.gov/public/search?cmd=search&reporttype=CORTESE&site_type=CSITES,FUDS&status=ACT,BKLG,COM&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29

California Department of Toxic Substances Control (2021). EnviroStar Search Tool, *Project Search Results*. Retrieved December 7, 2021, https://www.envirostor.dtsc.ca.gov/public/search?CMD=search&city=&zip=&county=Orange&case_number=&business_name=Former+Mercury+Cleaners&FEDERAL_SUPERFUND=True&STATE_RESPONSE=True&VOLUNTARY_CLEANUP=True&SCHOOL_CLEANUP=True&CORRECTIVE_ACTION=True&tiered_permit=True&evaluation=True&operating=True&post_closure=True&non_operating=True&inspections=True&inspectionsother=True

California Emergency Management Agency (2012a). *California Adaptation Planning Guide: Defining Local and Regional Impacts.*

California Emergency Management Agency (2012b). *California Adaptation Planning Guide: Identifying Adaptation Strategies.*

California Emergency Management Agency (2012c). *California Adaptation Planning Guide: Understanding Regional Characteristics.*

California's Fourth Climate Change Assessment (2021). *California's Changing Climate 2018: A Summary of Key Findings from California's Fourth Climate Change Assessment.*

California Office of Environmental Health Hazard Assessment (2017), *SB 535 Disadvantaged Communities*, Retrieved November 23, 2021, https://oehha.ca.gov/calenviroscreen/sb535.

California Natural Resources Agency (2009). *2009 California Climate Adaptation Strategy*.

City of Lake Forest (2020). *Final Environmental Impact Report*

City of Lake Forest (2020). *Lake Forest General Plan 2040*

City of Lake Forest (2021). *Water & Sewer Services*, Retrieved August 24, 2021, https://lakeforestca.gov/444/Water-Sewer-Services

De Novo Planning Group (2018). *City of Lake Forest General Plan Update: Existing Conditions Report.*

Drainage Area Management Plan (2003).

Fuladlu, Kamyar & Riza, Müge & Ilkan, Mustafa (2018). *The Effect of Rapid Urbanization on the Physical Modification of Urban Areas*.

Green Earth Operations Environmental Science and Engineering. Retrieved August 24, 2021, http://www.greenearthops.com/new/project/wusong-riverfront-treatment-wetland/4/

Hall, Alex, Neil Berg, Katharine Reich. (University of California, Los Angeles). *2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment*. Publication number: SUM-CCCA4-2018-007.

IPCC (2007). *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)],

Pierce, D. W., J. F. Kalansky, and D. R. Cayan, (Scripps Institution of Oceanography) (2018). *Climate, Drought, and Sea Level Rise Scenarios for the Fourth California Climate Assessment. California's Fourth Climate Change Assessment, California Energy Commission.* Publication Number: CNRA-CEC-2018-006.

South Orange County Integrated Regional Watershed Management Plan, (July 2013)

Southern California Association of Governments (2020), *Pre-Certified Local Housing Data For the City of Lake Forest*.

U.S. Environmental Protection Agency (2021). *Heat Island Effect*. Retrieved August 24, 2021, https://www.epa.gov/heatislands

U.S. Environmental Protection Agency (2008*). Reducing urban heat islands: Compendium of strategies. Draft*. Retrieved August 24, 2021, https://www.epa.gov/heat-islands/heat-island-compendium

Water Resources Planner (2021). *Irvine Ranch Water District 2020 Urban Water Management Plan.*

APPENDIX A: REGULATORY FRAMEWORK

STATE

California Air Resources Board

The California Air Resources Board is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA), which was adopted in 1988. The CCAA requires that all air districts in the state endeavor to achieve and maintain the California Ambient Air Quality Standards by the earliest practical date. The act specifies that districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources and provides districts with the authority to regulate indirect sources.

California Strategic Fire Plan

This statewide plan guides fire policy for much of California. The plan is aimed at reducing wildfire risk through pre-fire mitigation efforts tailored to local areas. The most recent update is the 2018 Strategic Fire Plan. The 2018 Plan reflects CAL FIRE's focus on: 1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and 2) natural resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation. There are also Unit Fire Plans produced under the Strategic Fire Plan that are localized to a county or region; the City of Lake Forest falls under the Orange County Unit Fire Plan.

State Water Resources Control Board/Regional Water Quality Control Board

In California, all wastewater treatment and disposal systems fall under the overall regulatory authority of the State Water Resources Control Board (SWRCB) and the nine California Regional Water Quality Control Board (RWQCBs), who are charged with the responsibility of protecting beneficial uses of State waters from a variety of waste discharges, including wastewater from individual and municipal systems. The City of Lake Forest falls within the jurisdiction of the Santa Ana and the San Diego Regional Water Quality Control Boards.

The RWQCBs' regulatory role often involves the formation and implementation of basic water protection policies. These are reflected in the RWQCBs' Basin Plans, generally in the form of guidelines, criteria and prohibitions related to the siting, design, construction, and maintenance of on-site sewage disposal systems.

State Water Board Storm Water Strategy

The Storm Water Strategy is founded on the results of the Storm Water Strategic Initiative, which serve to direct the State Water Board's role in storm water resources management and evolve the Storm Water Program by: a) developing guiding principles to serve as the foundation of the storm water program; b) identifying issues that support or inhibit the program from aligning with the guiding principles; and c) proposing and prioritizing projects that the Water Board could implement to address those issues. The State Water Board staff created a document called the Strategy to Optimize Management of Storm Water (STORMS). STORMS includes a program vision, mission, goals, objectives, projects, timelines, and consideration of the most effective integration of project outcomes into the Water Board's Storm Water Program.

Urban Water Management Planning Act

The Urban Water Management Planning Act has main objectives are the management of urban water demands and the efficient use of urban water. Under its provisions, every urban water supplier is required to prepare and adopt

an urban water management plan. The plan must identify and quantify the existing and planned sources of water available to the supplier, quantify the projected water use for a period of 20 years, and describe the supplier's water demand management measures.

California Department of Public Health

The Department of Public Health contains the Division of Radiation Safety and Environmental Management (DRSEM) which, is divided into three branches: the Radiologic Health Branch, the Environmental Health Branch, and the Drinking Water and Radiation Laboratory Branch. The Radiologic Health Branch enforces the laws and regulations designed to protect the public, radiation workers, and the environment. The Environmental Management Branch regulates the medical waste industry and recreational health (public swimming pools, ocean beaches and organized camps); provides sanitary surveillance of state institutions; administers the Registered Environmental Health Specialist (REHS) program; oversees radiological cleanup at military base closure facilities, coordinates the State's Indoor Radon Program, the Medical Waste Management Program and California Department of Public Health's Nuclear Emergency Response Program. The Drinking Water and Radiation Laboratory Branch is the State's primary drinking water quality testing laboratory and is the state laboratory capable of measuring chemical, microbiological, and radiochemical contaminants in drinking water and drinking water supplies.

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and each of the Regional Water Quality Control Boards (RWQCB) power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

California Building Code

The California Building Standards Code (CBSC) (California Code of Regulations, Title 24) is a statewide standard that is updated every three years, with the most recent update being in 2019. The CBSC is a compilation of three types of building standards from three different origins:

- Building standards that were adopted by state agencies without change from national model building codes
- Building standards that were adopted from national model codes but modified to address California-specific conditions
- Building standards, authorized by the California legislature, that constitute amendments not covered by national model codes, that were created to address particular California concerns.

The CBSC specifies materials requirements, construction methods, and maintenance standards for earthquake

protection and resiliency. All building occupancies in California are subject to national model codes adopted into the CBSC, and occupancies are further subject to amendments adopted by state agencies. State law also authorizes local governments to enact ordinances making building standards amendments to the CBSC to address local conditions. The law includes specific requirements for the basis for a local amendment, how the amendment language and documents must be prepared, and how the amendment must be filed with either the CBSC, the California Department of Housing and Community Development, or other state agencies as required. The City of Lake Forest adopted the 2019 CBSC into the City Municipal Code under Chapter 08.02, *California Building Code*.

California Fire Code

The California Fire Code, as a part of Title 24, California Code of Regulations, establishes the minimum requirements consistent with nationally recognized good practices to safeguard the public health, safety and general welfare from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises, and to provide safety and assistance to fire fighters and emergency responders during emergency operations. The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout the State of California. The City of Lake Forest has adopted the California Fire Code into Title 8 Building and Construction, Chapter 08.24*, California Fire Code*, of the Municipal Code.

Wildfire Protection Responsibility in California

Local, state, tribal, and federal organizations all have legal and financial responsibility for wildfire protection. In many instances, two fire organizations have dual primary responsibility on the same parcel of land—one for wildfire protection and the other for structural fire protection. To address wildfire jurisdiction responsibilities, in 1981 the California State Legislature outlined various wildfire responsibilities, described below, in Cal. Pub. Res. Code § 4291.5 and Cal. Health & Safety Code § 13108.5.

Federal Responsibility Areas (FRAs)

FRAs are fire-prone wildland areas that are owned or managed by a federal agency such as the U.S. Forest Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, or U.S. Department of Defense. Primary financial and rule-making jurisdiction authority rests with the federal land agency. In many instances, FRAs are interspersed with private land ownership or leases. Fire protection for developed private property is usually the responsibility of the relevant local government agency, not the federal land management agency.

State Responsibility Areas (SRAs)

SRAs are lands in California where the California Department of Forestry and Fire Protection (CAL FIRE) has legal and financial responsibility for wildfire protection. CAL FIRE administers fire hazard classifications and establishes development and building standard regulations in these areas. SRAs are defined as lands that:

- are in the unincorporated county areas
- are not federally-owned
- have wildland vegetation cover rather than agricultural or ornamental plants
- have row crops or seasonal crops, or
- have watershed, range, or forage values

CAL FIRE adopts SRA boundaries and updates them every 5 years. Where SRAs contain structures or development, the relevant local government agencies have fire protection responsibility for those improvements.

Local Responsibility Areas (LRAs)

LRAs include land in cities, cultivated agriculture lands, unincorporated non-flammable areas, and lands that do not meet the criteria for SRA or FRA. LRA fire protection is typically provided by city or county fire departments, fire

protection districts, or by CAL FIRE under contract to local governments. LRAs may include areas of flammable vegetation and WUI.
The City of Lake Forest contains only LRAs within City boundaries, and SRAs just north of City boundaries.

Alquist-Priolo Earthquake Fault Zoning Act & Seismic Hazards Mapping Act (1972)

The 1971 San Fernando Earthquake resulted in the destruction of numerous structures built along its fault. This led to passage of the Alquist-Priolo Earthquake Fault Zoning Act in 1972. This Act prohibits the construction of buildings for human occupancy across active faults in the state. Similarly, extensive damage caused by ground failure during the 1989 Loma Prieta Earthquake focuses attention on decreasing the impacts of landslides and liquefaction. This led to the creation of the Seismic Hazards Mapping Act (1990), which enhances construction standards at locations where ground failures are probable during earthquakes.

Senate Bill 610 & Assembly Bill 901 (2001)

SB 610 and AB 901 both modify the Urban Water Management Planning Act. SB 610 requires additional information in an urban water management plan if groundwater is identified as a water source supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 also requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights, and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over a given period of time. AB 901 also requires information on the how water quality affects water management strategies and supply reliability. The bill requires plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

California Oak Woodland Conservation Act (2001)

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California's oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the state.

Assembly Bill 1007 (2005)

Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) directs the California Energy Commission (CEC) to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepares the State Alternative Fuels Plan in consultation with state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assesses various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce

GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

California Executive Orders S-3-05 (2005)

On June 1, 2005, Governor Arnold Schwarzenegger signs Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by 2020 and 3) 80% below 1990 levels by 2050. While two of the benchmark years have passed, the City of Lake Forest, along with the rest of the State, can still aim to reduce GHG emissions 80% below the 1990 levels by the year 2050.

Assembly Bill 32 & Executive Order S-20-06 (2006)

In 2006, California adopts Assembly Bill (AB) 32, the Global Warming Solutions Act, as an effort to address the effects of climate change and help reach the goals presented in Executive Order S-3-05. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Bioenergy Action Plan- Executive Order S-06-06 (2006)

Executive Order S-06-06 establishes targets for the use and production of biofuels and biopower. The order also directs state agencies to work together to advance biomass programs while providing environmental protection and mitigation. The executive order establishes targets to increase production and use of ethanol and biodiesel fuels by a minimum of 20% by 2010, 40% by 2020, and 75% by 2050. Additionally, the executive order sets targets for the state related to the use of biomass electricity and cogeneration facilities.

Senate Bill 375 (2008)

California's Sustainable Communities and Climate Protection Act of 2008 (SB 375) requires transportation agencies to develop a regional "Sustainable Communities Strategy" of land use, housing, and transportation policies that will move the region towards meeting the GHG reduction target set by the CARB. On September 3, 2020, the Southern California Association of Governments (SCAG), the metropolitan planning organization responsible for Lake Forest and surrounding regions, adopt Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), which sets forth a long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals.

Assembly Bill 162 (2009)

This bill requires, upon the next revision of the housing element, on or after January 1, 2009, the Conservation Element of the General Plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a state-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 341 California's Mandatory Commercial Recycling Law (2012)

The purpose of AB 341 is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and to expand the opportunity for additional recycling services and recycling manufacturing facilities in California.

California Sustainable Groundwater Management Act (2014)

On September 16, 2014, Governor Brown signs into law a package of bills (SB 1168, AB 1739 and SB 1319) collectively called the Sustainable Groundwater Management Act. The Act requires local governments and water agencies with high and medium priority groundwater basins to halt overdraft and bring basins into sustainable levels of pumping and recharge. For each basin, local agencies are required to form new groundwater sustainability agencies and prepare groundwater sustainability plans with quantifiable objectives for achievement of sustainability within 20 years.

Senate Bill 379 (2015)

SB 379 revises Government Code Section 65302(g)(4) to require cities and counties to update their safety elements to address climate adaptation and resiliency strategies applicable to their jurisdiction. The updates are required at the next update of their local hazard mitigation plan (LHMP) on or after January 1, 2017. Local jurisdictions without an LHMP must update their safety elements beginning on or before January 1, 2022. The safety element update must include:

- A vulnerability assessment identifying the risks that climate change poses to the local jurisdiction
- A set of goals, policies, and objectives based on a vulnerability assessment for the protection of the community
- A set of feasible implementation strategies to carry out the goals, policies, and objectives

Statewide Emergency Water Conservation Regulations (2016)

In 2016, the State Water Resources Control Board (Water Board) adjusts emergency water conservation regulations in recognition of the differing water supply conditions and ongoing drought across the state to comply with the Governor's executive order declaring a drought emergency.

Executive Order B-37-16, Making Water Conservation a California Way of Life, updates temporary emergency water restrictions and transitions to permanent, long-term improvements in water use by:

- Providing for wiser water use
- Eliminating water waste
- Strengthening local drought resilience
- Improving agricultural water use efficiency and drought planning

In April 2017, a new Executive Order lifts the drought emergency, but retains many of the conservation requirements. Most regulations are still in effect except for water supply "stress test" requirements and conservation standards for urban water suppliers. The temporary restrictions establish a baseline of the types of benefits that are possible from water conservation requirements.

Senate Bill 1383 (2016)

In September 2016, Governor Brown signs SB 1383, Short-Lived Climate Pollutants: Organic Waste Methane Emissions Reductions, establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP) in various sectors of California's economy. The bill codifies the CARB's SLCP Reduction Strategy, established pursuant to SB 605 (2014), in order to achieve reductions in the statewide emissions of short-lived climate pollutants. Actions to reduce short-lived climate pollutants are essential to address the many impacts of climate change on human health, especially in California's most at-risk communities, and on the

environment.

California State Hazard Mitigation Plan (2018)

The 2018 California State Hazard Mitigation Plan is the state's primary hazard mitigation guidance document. It seeks to help communities with their mitigation and disaster resiliency efforts to reduce or eliminate potential risks and impacts of natural and human-caused disasters. The 2018 plan was approved by the Federal Emergency Management Agency (FEMA) on September 28, 2018, and includes:

- An updated statewide risk assessment, disaster history, and statistics
- Recent mitigation progress, success stories, and best practices
- Updated state hazard mitigation goals, objectives, and strategies
- Updated climate mitigation progress and adaptation strategies

California Water Plan (2018)

The California Water Plan is the state's strategic plan for sustainably managing and developing water resources for current and future generations. Required by Water Code Section 10005(a), it presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The plan is updated every 5 years, with the most recent update occurring in 2018.

LOCAL

City of Lake Forest General Plan

A variety of policies contained in the existing City of Lake Forest General Plan address climate change vulnerabilities. Specific goals included within the General Plan that are most related to climate change include:

Land Use & Design

- Goal LU-1 Land Use Mix. A community with a balanced land use pattern that meets the City's long-term housing, employment, and civic needs
    - Policy LU-1.1 Land Use Pattern. Promote an appropriate land use plan that fosters and enhances community livability and public health; supports economic development; promotes efficient development and multiple transportation options; reduces pollution, greenhouse gas emissions, and the expenditure of energy and other resources; and ensures compatibility between uses.

Mobility

- Goal M-3 Complete Streets. Provide a citywide a transportation network that is safe and accessible for all transportation modes and users.
    - Policy M-3.1 Transportation Improvements for All Users. Strive to apply Complete Streets principles to new roadways and to new transportation improvements on City facilities to serve all types of travel (including pedestrians, bicyclists, motorists, public transportation, and goods movement) and all abilities.
    - Policy M-3.2 Eliminating Gaps. Continue to identify and address gaps in networks serving automobiles, bicyclists, pedestrians, transit users, equestrians, and other users. Remove manmade barriers to accessibility and connectivity.
    - Policy M-3.3 ADA Accessibility. Ensure the City's transportation network is safe, accessible, and consistent with the Americans with Disabilities Act (ADA), to allow impaired users, such as disabled persons and seniors, to safely travel within and beyond the city.

- Goal M-5 Bicycle, Pedestrian, and Equestrian Use. Support and promote the use of pedestrian, bicycle, and equestrian facilities.
    - Policy M-5.1 Promote Non-Vehicular Modes. Promote the provision of non-vehicular circulation modes within Lake Forest
    - Policy M-5.2 Pedestrian Access Between Uses. Improve pedestrian access between complementary uses such as residential and commercial areas and seek to increase the number of bridges and/or grade-separated crossings over freeways and major roadways.
    - Policy M-5.3. Recreational Trails. Work with the County of Orange to ensure local trails are open and maintained and facilitate access to and from the trails within Lake Forest.
    - Policy M-5.6 Effects of New Technologies on Active Transportation. Monitor and evaluate the development of new mobility technologies (such as bikeshare, scootershare, and electric bikes) and the potential effects on non-vehicular travel and mode choice in Lake Forest and the region.
- Goal M-8 Vehicle Miles Traveled. Reduce citywide vehicle miles traveled per capita and contribute to regional and statewide greenhouse gas emission targets.
    - Policy M-8.1 VMT Thresholds. Establish vehicle miles traveled (VMT) thresholds and Transportation Demand Management (TDM) mitigation requirements for the purposes of environmental review under the California Environmental Quality Act (CEQA). The City shall continue to maintain LOS standards for the purposes of planning and designing street improvements.

Recreation and Resources

- Goal RR-1 Parks and Recreation. A community with high-quality parks and recreational amenities.
    - Policy RR-1.4 Design and Maintenance. Promote implementation of established design, construction, and facility maintenance standards to ensure that existing and future City amenities are of high quality in regard to safety, utility, environmental stewardship, and aesthetic quality.
    - Policy RR-1.5 Innovative Design. Maintain and update design standards for City parks and trails based on proven best practices and innovations in public safety, active transportation, and recreation planning.
    - Policy RR-1.9 Landscaping. Protect local and regional resources by fortifying new parks and recreational development with sustainable drought-tolerant landscaping.
    - Policy RR-2.1 Open Space Boundaries. Maintain the amount of existing open space within the City of Lake Forest by carefully considering the impact of new development in established open space areas.
    - Policy RR-2.2 Regional Partners. Coordinate with regional partners to maintain and preserve open space areas under overlapping jurisdiction or within nearby communities to protect all local and regional opportunities for recreation available to Lake Forest residents.
    - Policy RR-2.4 Education. Work with state, federal, and community partners to develop educational and other materials that promote the preservation and conservation of Lake Forest's natural resources.
- Goal RR-4 Air Quality and Greenhouse Gas Emissions
    - Policy RR-4.1 Regional Standards. Coordinate planning efforts with the South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG), and the California Air Resource Board (CARB) to meet local and regional air quality standards and ensure attainment of established goals.
    - Policy RR-4.3 Development. Encourage and incentivize the development of mixed-use residential opportunities and live-work environments within the City to lessen the impacts of traffic congestion on local air quality.
    - Policy RR -4.4 Active Transportation. Improve active transportation options within the City by connecting local bikeways and trails to City bus stops and public transportation centers.
    - Policy RR- 4.5 Public Transit. Coordinate with the OCTA and actively pursue the improvement and expansion of public transit for Lake Forest residents.

- Policy RR-4.6 Sensitive Receptors. Insulate sensitive receptors from areas of heightened air quality pollution, including highways, by utilizing land use planning to buffer and protect residential areas.
- Policy RR- 4.7 Mitigation. Require the implementation of relevant mitigation measures for all future development upon identification of potential air quality impacts.
- Policy RR -4.8 Local Reduction Targets. The City of Lake Forest establishes the following per capita GHG reduction targets, in order to meet the requirements established by the state under AB 32 and SB 32, consistent with the CARB's 2017 Scoping Plan:
    - 3.99 MT CO_2e per capita by 2030
    - 2.66 MT CO_2e per capita by 2040; and
    - 1.33 MT CO_2e per capita by 2050.
- Policy RR- 4.9 GHG Reduction. Consider and adopt new policies and programs that will help to provide energy efficient alternatives to fossil fuel use and reduce consumption in order to reduce greenhouse gas emissions.
- Policy RR-4.10 Carbon Reduction. Expand the number of parks and trees in Lake Forest to provide a larger carbon sink or area containing natural sources that retain more carbon than what those sources emit.
- Policy RR-4.11 Public Engagement. Promote regional air quality programs in order to inform the public on regional air quality concerns and encourage the engagement of all Lake Forest residents in future planning decisions related to air quality

- Goal RR-5 Biological Resources. A community that harmoniously coexists with existing plant and animal life.
    - Policy RR-5.1 City Programs. Promote City programs that focus on habitat protection and biological conservation.
    - Policy RR-5.2 Regional Coordination. Coordinate with county, state, and federal agencies and local nonprofits to protect and preserve biologic resources in Lake Forest.
    - Policy RR-5.3 Sensitive Communities. Protect and conserve Lake Forest's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.
    - Policy RR-5.4 Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in Lake Forest in accordance with state and federal resource agency requirements.
    - Policy RR-5.5 Native Species. Encourage the use of native vegetation where possible.
    - Policy RR-5.6 Wildlife Corridors. Participate in the planning of drainage channels, ridgelines, and other areas that provide potential wildlife linkages between open space areas in the community and the vicinity.
    - Policy RR-5.7 Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.
    - Policy RR-5.8 Local Coordination. Coordinate with private and public organizations within the region to implement strategies and programs that protect and preserve biological resources within Lake Forest.
    - Policy RR-5.9 Human Interaction. In areas where residents and sensitive biological resources interact, establish protective policies and/or implement design features to protect and insulate biological resources from human impacts
    - Policy RR-5.10 Urban Forest. Build upon existing streetscapes and develop an urban forest along the City's major corridors to provide avian habitat, sequester carbon monoxide emissions, foster pedestrian activity, and provide shade. The City's "urban forest" refers to all public- and privately-owned trees, vegetation, and landscaping throughout Lake Forest which provide a range of benefits to the community, including reduced energy use, cooling along streets and sidewalks, improved air and water quality, diversification of wildlife habitat, and increased health and well-being.
- Goal RR-6 Solid Waste Management and Recycling A community that minimizes the generation and disposal

of waste to landfills through recycling and participation in waste diversion programs.

- Policy RR-6.1 Compliance with State Legislation. Compliance with and Exceedance of State Legislation. Continue to comply with all State regulations regarding waste diversion, source reduction, recycling, and composting, and strive to achieve an 85% diversion rate from landfills by 2040.
- Policy RR-6.2 Compliance with Regional Plans. Reduce the per capita generation of solid waste in Lake Forest in concert with the County of Orange source reduction and recycling plans for reducing solid waste.
- Policy RR-6.3 Waste Service Performance Collection Facilities. Support efforts of the solid waste service provider to maintain adequate residential, commercial, and industrial solid waste and mixed recycling collection service levels and solid waste facilities in accordance with state law, and periodically review waste collection performance to verify adequacy of service
- Policy RR-6.4 Landfill Capacity. Continue to coordinate with the County of Orange to ensure adequate landfill capacity in the region.
- Policy RR-6.5 Municipal Waste. Increase the City's role in the source reduction and recycling components of waste management through recycling programs at City facilities to reduce the quantity of City generated waste.
- Policy RR-6.7 Hazardous Waste. Promote the proper disposal of hazardous waste—including paint, tires, medications, medical sharps, infectious waste, asbestos waste, construction waste, and electronic waste; encourage materials to be recycled or disposed of in a manner that is safe for the environment, residents, and visitors to Lake Forest.
- Policy RR-6.8 Organic Waste. Explore opportunities to collect and compost organic matter, including grass clippings, landscaping, Christmas trees, composting and mulch, and other sources of organic waste; when feasible distribute for use in parks, medians, and other municipal areas
- Policy RR-6.9 Public Education. Promote citywide educational programs to inform citizens of the benefits of recycling and appropriate recycling options and locations

Public Safety

- Goal PS-1 Seismic and Geologic Hazards. A community that is adequately prepared for natural hazards related to landslides, geologic instability, and seismic activity
  - Policy PS-1.2 Earthquake Protection. Enforce State seismic design guidelines and all relevant building codes to reduce the risk of damage associated with seismic activity
  - PS-1.3 Liquefaction. Require special site-specific studies in areas potentially subject to liquefaction (shown in Figure 9-5 of the General Plan Existing Conditions Report) to determine the nature and extent of possible liquefaction and to identify engineering and development siting measures to permit development to occur.
  - PS-1.4 Development. Require assessment and mitigation of hazards related to liquefaction, landslides, and flooding for new development projects or City improvement projects that are identified by the City as susceptible to these hazards.
  - PS-1.5 Risk Inventories. Develop inventories of at-risk public buildings and infrastructure within the City of Lake Forest and evaluate potential mitigation projects to address risks, as financially feasible.
  - PS-1.6 Critical Facilities. Require new critical infrastructure and facilities that may be built in the City to incorporate site specific seismic structural design as required by applicable building codes.
  - PS-1.7 Public Education. Educate the public through programs and outreach materials on natural threats pertaining to Lake Forest and best practices for reducing damage and personal harm.
- Goal PS-2 Fire Safety. A City that is safe and adequately prepared for urban and wildfire emergencies.
  - Policy PS-2.2 Fire Protection Services. Coordinate with the Orange County Fire Authority and

CalFire as it protects the safety and security of the Lake Forest community.

- Policy PS-2.3 Fire Hazard Identification. Maintain and regularly update the City's fire hazard overlay map for changes in fire hazard severity districts consistent with changes in hazard designations by CAL FIRE.
- Policy PS-2.4 Very High Fire Hazard Zone. Require that all development in Very High Fire Hazard Zones meet Very High Fire Hazard Zone standards as designated by City Ordinance
- Policy PS-2.5 Urban Fire Risks. Work with the City's fire service provider to maintain an ongoing fire inspection program to reduce fire hazards associated with multifamily development, critical facilities, public assembly facilities, industrial buildings, and nonresidential buildings.
- Policy PS-2.6 Grant Funding. Seek grant funding, on our own and in collaboration with regional partners, to mitigate potential wildfire threats to the community and to implement special training workshops and projects related to defensible space and fuel reduction practices.
- Policy PS-2.7 Regional Coordination. Coordinate with the County of Orange, neighboring cities, and other fire protection agencies to reduce the potential for wildfire hazards in the Saddleback Valley
- Policy PS-2.8 Interagency Support. Participate in the mutual aid system and automatic aid agreements to back up and supplement capabilities to respond to emergencies.

- Goal PS-3 Flood Hazards. A community that is protected from potential flood hazards.
  - Policy PS-3.1 Regulatory Compliance. Coordinate with local, state, and federal agencies to ensure that the City's regulations related to flood control are in compliance with federal, State, and local standards.
  - Policy PS-3.2 FEMA Coordination. Coordinate with the Federal Emergency Management Agency (FEMA) to ensure that Federal Insurance Rate Maps correctly depict flood hazards in the City.
  - Policy PS-3.3 Municipal Code. Implement the standards and requirements defined in the Municipal Code to reduce flood hazards and address flood-prone areas within Lake Forest.
  - Policy PS-3.4 Existing Flood Zones. Maintain dialogue with the County of Orange regarding regional flood facilities.
  - Policy PS-3.5 Changing Conditions. Coordinate with the Orange County Flood Control District to consider the need to expand the capacity of flood control facilities based on changing flood conditions associated with climate change and extreme weather.
  - Policy PS-3.6 Mitigation. Require that all new development and redevelopment in areas susceptible to flooding incorporate mitigation measures designed to reduce flood hazards.
  - Policy PS-3.7 Adequate Infrastructure. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system is functioning property.
- Goal PS-4 Hazardous Waste and Materials A community that is protected from the potential for hazardous waste and materials contamination.
  - Policy PS-4.1 Regulations. Ensure that the Orange County Fire Authority continues to enforce the Uniform Fire Code relating to the use of hazardous material and ensure that appropriate regulations are followed and precautions are taken for the type and amount of hazard being created.
  - Policy PS-4.2 Cleanup Sites. Require that developers coordinate with the Orange County Health Care Agency to confirm that hazardous waste cleanup sites located within the City are remediated by the property owner in a manner that keeps the public safe.
  - Policy PS-4.3 County Plans. Utilize the Orange County Hazardous Waste Management Plan to ensure that local regulation and practices are consistent with the policy direction and action programs that the County recommends.
  - Policy PS-4.4 Proposed Facilities. Require appropriate environmental analysis to be conducted for any proposed hazardous waste materials treatment or transfer, in accordance with

environmental review requirements.

- Policy PS-4.5 Emergency Response. Work with the Orange County Fire Authority and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.
- Policy PS-4.6 Public Education. Coordinate with the City's waste service provider(s) and the County of Orange to increase public awareness about proper disposal related to household hazardous waste and inform the Lake Forest community regarding relevant services and programs to address issues related to hazardous waste and materials.

- Goal PS-5 Emergency Operations. A community that is highly prepared and equipped to handle emergency situations, in order to minimize loss of life, injury, property damage, and disruption of vital services.
  - Policy PS-5.1 Critical Facilities. Coordinate with service providers to ensure the resilience of critical facilities, lifeline services, and infrastructure, and plan for the use of critical facilities during post-disaster response and recovery
  - Policy PS-5.2 Emergency Preparedness Plans. Maintain an updated Emergency Operations Plan specific to Lake Forest.
  - Policy PS-5.3 Local Coordination. Coordinate with local key stakeholders (officials, schools, businesses, and organizations) within the community to make them aware of their role in the emergency plan and the necessary requirements in case of emergency.
  - Policy PS-5.4 Automatic and Mutual Aid. Continue to participate in automatic and mutual aid agreements with adjacent service providers to ensure efficient and adequate resources, facilities, and support services during and after emergencies.
  - Policy PS-5.5 Communications. Evaluate the potential to utilize a comprehensive emergency communication system that allows for efficient connection in case of emergency.
  - Policy PS-5.6 Emergency Evacuation Routes and Access. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.
  - Policy PS-5.7 Emergency Shelters. Periodically coordinate with emergency shelter providers to ensure that necessary equipment supplies are available in case of emergency.
  - Policy PS-5.8 Community Training Programs. Continue to support community-based emergency training programs as a valuable asset to the community.
  - Policy PS-5.9 Public Awareness. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible.
  - Policy PS-5.10 School Safety. Coordinate with local schools related to their programs and practices regarding emergency preparedness.
- Goal PS-7 Climate Change and Resiliency Planning. A well-prepared community where risks to life, property, the economy, and the environment resulting from climate change, including extreme weather events, are minimized.
  - Policy PS-7.1 Community Preparedness. Promote a well-prepared City that can effectively overcome natural disasters and scarcity of resources due to climate change.
  - PS-7.2 Regional Actions. Participate in discussions regarding regional actions that reduce impacts from climate change.
  - Policy PS-7.3 Community Engagement. Educate the community regarding potential hazards due to climate change and develop programs and educational material to encourage public readiness.
  - Policy PS-7.4 Ecological Recovery. Coordinate with federal, state, and local agencies to establish ecological recovery programs.
  - Policy PS-7.5 Energy Supply. Promote plans and programs that increase sustainable energy

sources.

- Policy PS-7.6 Programs. Implement necessary actions and programs to improve drought preparation and response for the most vulnerable community members.
- Policy PS-7.7 Cooling Centers. Designate public buildings, specific private buildings, or institutions with air conditioning as public cooling shelters; extend hours at airconditioned sites during periods of extreme heat or power outage (if the site is supported by a backup generator).
- Policy PS-7.8 Storms. Continue to provide access to flood protection resources and services (signage, sandbags, etc.) as feasible at designated public facilities during and after extreme weather events.
- Policy PS-7.9 Special Assistance. Address the needs of individuals with limited mobility or limited access to transportation for access to safe and comfortable shelter during extreme heat events or other severe weather events.
- Policy PS-7.10 Leadership. Demonstrate leadership in local climate planning efforts through a range of tangible actions and policies at the municipal operations level.

Public Facilities

- PF-1.4 Impact on Resources. Require new utility infrastructure to avoid sensitive natural and cultural resources to the greatest extent feasible.
- PF-1.6 Infrastructure Rehabilitation. Prioritize the regular maintenance and rehabilitation of public facilities and critical infrastructure to extend its useful life
- Policy- 2.4 Mixed-use Developments. Encourage mixed-use developments along major corridors and around activity and employment centers, as defined in the Land Use Element, to reduce public service costs and environmental impacts through compatible land use relationships, and efficient circulation and open space systems
- Policy PF-3.3 Water Pressure. Coordinate with local water districts and Orange County Fire Authority to encourage water pressures that remain high enough throughout all areas of the community to provided needed water capacity for fire protection
- Policy PF-3.5 Educate the Public. Educate the public on water issues and conservation strategies, in partnership with water districts and regional partners; focus on business activities with the potential to pollute and distribute Best Management Practices (BMP) guidance for business activities.
- Policy PF-3.6 Water Conservation. Support water conservation measures that comply with state and federal legislation and that are consistent with measures adopted in all applicable Urban Water Management Plans.

- Goal PF-4 Wastewater System A community with a wastewater system that is efficient, safe, and cost-effective.
  - Policy PF-4.2 Sewer Deposit Best Practices. Encourage wastewater service providers to identify and implement best practices and feasible technologies for wastewater collection and treatment, including those that reduce the amount of wastewater requiring treatment, prevent contamination, maintain the highest possible energy efficiency, and reduce costs and greenhouse gas (GHG) emissions.
  - Policy PF-4.3 Reduced System Demand. Reduce wastewater system demand by encouraging waterconserving designs and equipment, encouraging water-conserving devices, and designing wastewater systems to minimize inflow and infiltration.
  - Policy PF-4.4 Recycled Water. Work with water districts and end users to increase and maximize the use of recycled water for existing and future needs as new technology, funding, and infrastructure is available.
  - Policy PF-4.6 Public Education. Collaborate with water districts in developing a public education

program that teaches residents and businesses how to help maintain a safe and clean wastewater system, such as by limiting the amount of oils, pesticides, and toxic chemicals entering the sewer system.

- Goal PF-5 Storm Drain System. A community with an efficient, attractive, and environmentally sound storm drain system.
    - Policy PF-5.1 Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.
    - PF-5.2 Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.
    - PF-5.3 Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.
    - PF-5.4 Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations
    - PF-5.5 Recycled water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.
    - PF-5.6 Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.
    - PF-5.7 Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.
    - PF-5.8 County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.
    - PF-5.9 National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.
    - PF-5.10 Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.
- Goal PF- 6 Energy Management A community with adequate power, provided through economically and environmentally sustainable means.
    - Policy PF-6.1 Compliance with State Legislation. Comply with all state requirements regarding the generation of power and encourage energy providers to investigate the use or expansion of renewable sources of energy.
    - Policy PF-6.3 City-Sponsored Projects and Activities. Evaluate renewable energy capacity on municipal property and renewable energy use in City-sponsored projects and activities
    - PF-6.5 Conservation. Promote conservation strategies during design, construction, and maintenance of facilities.
    - Policy PF-6.7 Public Education. Promote public education programs that advocate for reducing energy consumption, and promote renewable sources of energy
    - Policy PF-6.9 Promote Energy Conservation in Existing Building Stock. Promote energy conservation by residents and businesses in existing structures, through the City's newsletter, flyers, and website, in close coordination with other agencies and local energy providers, including the SCAQMD and Southern California Edison.
    - Policy PF-8.1 Police and Fire Department Facilities. Encourage the Orange County Fire Authority and the Orange County Sheriff's Department to maintain adequate staff and equipment to

provide efficient, high quality, and responsive fire protection and emergency medical services to existing and future growth in Lake Forest.

- Policy PF-8.2 Emergency Response Times. Work cooperatively with the Orange County Fire Authority, Orange County Sheriff's Department, and providers of emergency medical services to ensure acceptable response times in accordance with provider standards, and seek opportunities to improve emergency response times throughout Lake Forest.

Health and Wellness

- Policy HW-2.9 Environmental Justice. Assess the disproportionate impacts of environmental pollution and work to remedy these disproportionate impacts

CITY OF LAKE FOREST MUNICIPAL CODE

Chapter 2.20*, Disaster Relief*, of Title 2, *Administration and Personnel*, provides for the preparation and carrying out of plans for the protection of persons and property within this City in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of this City with all other public agencies, corporations, organizations, and affected private persons.

Chapter 3.28, *Mobile Source Air Pollution Reduction Trust Fund*, is intended to support the SCAQMD's imposition of the requirements set fourth in the Health and Safety Code in order to receive fee revenues for the purpose of implementing programs to reduce air pollution from motor vehicles.

Title 6, *Health and Sanitation* contains a range of policies that pertain to environmental impacts. Chapter 6.16 *Hazardous Materials* and 6.24, *Unlawful Dumping* discuss proper handling and disposal of hazardous materials. Whereas, Chapter 6.20 *Regulations Pertaining to Conversion, Maintenance and Removal of Eucalyptus Trees*, establishes regulations so as to preserve the trees from both manmade harms (development) and natural harms (dangerous beetles).

Chapter 7.08, *Standards of Design*, contains guidelines pertaining to underground utility lines (7.08.100), sewers (7.04.110), drainage and erosion control (7.08.115), parks, (7.08.125), rivers and streams (7.08.135), lakes and reservoirs (7.08.140), fire protection (7.08.145), dangerous areas to be removed or controlled (7.08.150), and floodplains (7.08165).Chapter 7.38, *Dedication of Land for Park Facilities and Payment of In Lieu Fees*, implements the provisions of the Quimby Act, which authorizes a City to require the dedication of land for park facilities and/or payment of in lieu fees incident to and as a condition of the approval of a tentative map or tentative parcel map for certain subdivisions.

Title 8, *Buildings and Construction*, contains regulations and standards that deal with all stages of construction and development. The California Building Code is included in this Title as Chapter 8.02. The California Residential Code, Electrical Code, Plumbing Code, Mechanical Code, and Fire Code are also included within this Title. Chapter 8.30, *Lake Forest Grading and Excavation Code*, adopts the Orange County Grading Manual which regulates grading operations and ensures water quality is protected. The purpose of Chapter 8.70, *Flood Damage Prevention and Floodplain Management*, is to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions.

Title 9, *Planning and Zoning*, contains various regulations and permitted uses for designated land uses. Chapter 9.148, *Public Safety Radio System Coverage*, sets forth a regulatory framework to provide effective coverage throughout the City for the Countywide Coordinated Communication System utilized by police and fire personnel for public safety services. Chapter 9.236, *Open Space Conservation District*, provides for the preservation of regionally significant open space lands.

Title 13, *Parks and Recreational Facilities*, (13.04 *Parks and Recreation Facility Regulations*, 13.04.026 *Hunting and Fishing*, 13.04.028, *Damaging Land*, 13.04.032*, Water,* 13.04.034, *Fire and fireplaces*,) discusses regulations that either directly or indirectly affect the City's natural resources, open spaces, and recreational facilities. With the Foothill Ranch and Portola Hills open spaces, there are opportunities to be emersed in, and interact with wildlife; the City's rules with interaction of plants, resources, and wildlife are detailed in this Title.

Title 15, *Water and Sewers*, contains Chapter 15.14, *Stormwater Quality Management*, which implements the Federal Water Pollution Control Act (also known as the Clean Water Act) and the California Water Code by prohibiting the discharge of any pollutant to navigable waters of the US form a point source unless the discharge is authorized by a permit issued pursuant to the National Pollutant Discharge Elimination System (NPDES) required by the Clean Water Act.

Orange County Local Hazard Mitigation Plan (2021)

The County of Orange and Orange County Fire Authority collaboratively developed a Local Hazard Mitigation Plan (LHMP) in 2015. In May 2021, an update to the County's LHMP was made available for public review, which also includes a discussion of climate change and associated risks. The LHMP is developed collaboratively with emergency management staff, County and external partners, and Orange County residents. The updated LHMP represents a critical step in continuing Orange County's commitment to hazard mitigation as one component of its comprehensive emergency management program. As a multi-jurisdiction plan, the LHMP focuses on mitigating all natural hazards impacting unincorporated areas of the County as well as County and Orange County Fire Authority owned facilities.

The mission of this LHMP is to promote sound public policy designed to protect residents, critical facilities, infrastructure, key resources, private property, and the environment from natural hazards in unincorporated areas, fire hazards in the Fire Authority service area, and County and Fire Authority owned facilities.

Unified County of Orange & Orange County Operational Area Emergency Operations Plan (2019)

The Unified County of Orange (County) and Orange County Operational Area (OA) Emergency Operations Plan (EOP) provides guidance and procedures for the County and the County as the OA to prepare for and respond to natural, technological, conflict-related, and human-caused incidents creating situations requiring a coordinated response. It provides guidance for management concepts, identifies organizational structures and relationships and describes responsibilities and functions of the emergency organization to protect life and property. The plan describes the emergency organization and the process of preparing, responding to, and recovering from disasters.

Orange County Stormwater Resource Plan 2021

The Orange County Stormwater Resource Plan (OC SWRP) was prepared by Orange County per the requirements of SB 985. SB 985 requires the preparation of a Storm Water Resource Plan as an eligibility requirement for an entity to receive grant funding from a voter-approved bond initiative for a storm water and/or urban runoff project. Four primary significant planning efforts referenced throughout this OC SWRP are used for functional equivalency to meet the SWRP guidelines. These include (1) the 2013/2014 Reports of Waste Discharge (ROWDs), (2) Integrated Regional Watershed Management Plans for North, Central and South Orange County, (3) Watershed Infiltration and Hydromodification Management Plan (WIHMP) mapping tools, and (4) the South Orange County Water Quality Improvement Plan (WQIP).

Orange County Drainage Area Management Plan 2003

The specific water pollutant control program elements of the Orange County Stormwater Program are documented in the 2003 Drainage Area Management Plan (DAMP) and corresponding Local Implementation Plans (LIPs), which

serve as the Permittees' primary policy and implementation documents for compliance with the NPDES Stormwater permits. The DAMP was prepared and is periodically updated using a consensus building process that involving public and private sector input and public review through the California Environmental Quality Act (CEQA) process. The DAMP is the principal guidance and compliance document for the county-wide implementation of the stormwater program and provides a foundation for the Orange County Stormwater Permittees to implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable.

City of Lake Forest Local Implementation Plan 2010

The City Local Implementation Plan (LIP) is the principal guidance and compliance document specific to the City of Lake Forest's jurisdiction. The LIP provides description and detail of the City's water quality program implementation activities; it is designed to work in conjunction with the Orange County DAMP. The main objectives of the DAMP and LIPs are to comply with the NPDES permit requirements and to evaluate the impacts of urban stormwater quality on beneficial uses.

Municipal NPDES Permit Waste Discharge Requirements 2009

On May 19, 2009, the Santa Ana Regional Water Quality Control Board adopted Order No. R8-2009-0030, NPDES No. CAS618030. On December 16, 2009, the San Diego Regional Water Quality Control Board adopted Order No. R9-200-0002, NPDES No. CAS018740. These Municipal NPDES Permits require the permittees to continue to implement stormwater quality management programs and develop additional programs in order to control pollutants in stormwater discharges.

The City of Lake Forest is split by the jurisdictional boundaries of these two California Regional Water Quality Control Boards. The northwestern portions of the City fall under the requirements of the Santa Ana Regional Water Quality Control Board, and the southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The jurisdictional boundaries are defined by the geographic division of watersheds; however, the boundary line can roughly be delineated by El Toro Road.[10]

Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin 2019

The Santa Ana Region (Region 8) includes the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other small drainage areas. The Santa Ana Region covers parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. The northwestern portion of the City of Lake Forest, approximately north of El Toro Road, is located within this region.

Water Quality Control Plan (Basin Plan) for the San Diego Basin 2011

The San Diego Region (Region 9) occurs within the Peninsula Range Physiographic Province of California. One of the most prominent physical features in the region is the northwest-trending Peninsula Range which includes from the north to south, the Santa Ana, Agua Tibia, Palomar, Volcan, Cuyamaca and Laguna Mountains. The southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The San Diego Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain valley area. The southern portion of the City of Lake Forest is located within this region.

South Orange County Watershed Management Area Integrated Regional Watershed Management Plan (2013)

The South Orange County Integrated Regional Water Management (IRWM) Plan coordinates with existing plans and

[10] Page 7-13 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

research documents provided by the participating agencies in a manner that identifies and integrates regional projects to improve water supply, protect water quality, enhance the environment, and provide flood risk management. This Plan establishes a priority ranking to help further regional efforts to investigate the feasibility of, and identify funding for, these projects. Individual projects however, will go through the appropriate environmental review and permitting process as funding is secured.

Irvine Ranch Water District (IRWD)- 2020 Urban Water Management Plan

The IRWD Urban Water Management Plan (UWMP) serves as a long-range planning document for water supply and demand and provides an overview of IRWD's water supply and usage, recycled water and conservation programs. The UWMP identifies the imported and local water supplies that will meet future demands including groundwater recovery and water recycling, as well as IRWD's current and planned conservation measures. This helps to ensure that IRWD can provide our service area with a reliable supply of high-quality water and meet current and future demand. The plan is updated every five years and submitted to the California Department of Water Resources. IRWD held a public hearing to adopt the 2020 WSCP on Monday, June 28, 2021. The public hearing provided an opportunity for the public to provide input to the plan before it was adopted. No comments were received from the public. The adoption of the 2020 WSCP was combined with the public hearing.

El Toro Water District (ETWD)- 2020 Urban Water Management Plan

The ETWD, as one of MWDOC's 28 member agencies, prepared this 2020 UWMP in collaboration with Municipal Water District of Orange County (MWDOC), Metropolitan Water District of Southern California (MET), South Orange County Wastewater Authority (SOCWA), and other key agencies. This 2020 UWMP provides an assessment of the present and future water supply sources and demands within the District's service area. It presents an update to the 2015 UWMP on the District's water resource needs, water use efficiency programs, water reliability assessment and strategies to mitigate water shortage conditions. It also presents a new 2020 Water Shortage Contingency Plan (WSCP) designed to prepare for and respond to water shortages. This UWMP was adopted by the Board of Directors on May 27, 2021.

Lake Forest Sustainability Plan

The Lake Forest Sustainability Plan includes the goals related to reducing the amount of fossil fuels consumed within the City of Lake Forest including the following goals: (1) Reduce energy consumption in homes and businesses, and (2) Expand the use of renewable energy throughout the community.[11]

Orange County Water District Groundwater Management Plan 2015 Update

The Orange County Water District's (OCWD) first Groundwater Management Plan was published in 1989; the Groundwater Management Plan 2015 Update is the fifth update. Groundwater basin management goals are (1) to protect and enhance groundwater quality, (2) to protect and increase the sustainable yield of the basin in a cost-effective manner, and (3) to increase the efficiency of District operations. Nineteen major groundwater producers, including cities, water districts, and private water companies, pump water from about 200 large-capacity wells for retail water use. There are also approximately 200 small-capacity wells that pump water from the basin. OCWD protects and manages the groundwater resource for long-term sustainability, while meeting approximately 60 to 70 percent of the water supply demand within its service area.

South Coast Air Quality Management District

The SCAQMD shares responsibility with the California Air Resources Board for ensuring that all state and federal

[11] Page 9-24 of the Existing Conditions Report prepared by De Novo Planning Group, 2018

ambient air quality standards are achieved and maintained over an area of approximately 10,743 square miles. This area includes all of Orange County and Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The SCAQMD reviews projects to ensure that they do not (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay the timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan. More information can be found on the agency's website: http://www.aqmd.gov/

CITY OF LAKE FOREST SB 99 ANALYSIS WHITE PAPER

Residential Emergency Evacuation Route Analysis

Prepared by De Novo Planning Group

December 2021

City of Lake Forest SB 99 Analysis White Paper

In coordination with its focused Public Safety Element Update (2021), the City of Lake Forest has prepared an analysis consistent with Senate Bill 99 to identify residential developments in high hazard zones that do not have at least two emergency evacuation routes. The analysis identified four residential areas of concern in high hazard zones that warranted further study. The following is an explanation of the methodology used to map the evacuation routes.

Definitions & Data Sources

Residential Developments

As part of the Lake Forest General Plan update, a parcel layer was developed that included information about the General Plan Land Use designations and the on-ground/assessed uses for each parcel. Parcels that had the following on-ground land uses were considered Residential Areas.

- Mixed Residential
- Mobile Homes and Trailer Parks
- Multi-Family Residential
- Single Family Residential

High Hazard Zones

High Hazard Zones were defined as areas that are in one or more of the following pre-defined hazard zones:

1. FEMA's 100-year flood zone (PRESENT)
2. California OES dam inundation area (none within the city)
3. California Geological Survey's Map Sheet 58 Landslide Susceptibility classes 8, 9, or 10 (PRESENT)
4. California Geological Survey's Potential Liquefaction areas, mapped as part of the California Seismic Hazard Zonation Program (PRESENT)
5. California Geological Survey's Potential Landslide areas, mapped as part of the California Seismic Hazard Zonation Program (PRESENT)
6. CalFire's High, Very High, and Extreme Fire Threat zones (PRESENT)
7. CalFire's Very High Fire Hazard Severity Zones in Local Responsibility Areas (PRESENT)

These high hazard zones were combined into one single "Combined Hazard Area" using ArcGIS merge and dissolve geoprocessing tools.

Evacuation Routes

Road data obtained from the Orange County GIS Open Data Portal were utilized to identify points of exit from clusters (neighborhoods) of residential areas. Road centerlines were divided into three main classes:

1. **Interstates/State Routes** – I-5 and State Route (SR) 241

2. **Arterials** – as defined by Orange County GIS data "Arterials"
    a. Alton Parkway
    b. Bake Parkway
    c. El Toro Rd
    d. Glenn Ranch Rd
    e. Jeronimo Rd
    f. Lake Forest Dr
    g. Los Alisos Blvd
    h. Muirlands Blvd
    i. Portola Pkwy
    j. Rancho Pkwy
    k. Ridge Route Dr
    l. Rockfield Blvd
    m. Santiago Canyon Rd
    n. Toledo Way
    o. Trabuco Rd
3. **Minor/Residential Roads** – All other roads not considered "Arterial" by the Orange County GIS roads dataset. These roads are generally the first roads a resident will encounter when departing their residence.

Assumptions & Methodology

Identification of Residential Areas in High Hazard Zones

Using ArcGIS, Residential Areas in High Hazard Zones were identified by a running a location query to find the parcels with residential on-ground uses that intersect the single Combined Hazard Area.

Identification of Residential Area Exit Points

The goal of this analysis was to find at least two separate points of exit from residential areas by following a rudimentary roadway network in which vehicles move from Minor/Residential Roads to Arterials, and eventually to an Interstates/State Routes. The following assumptions apply:

1. Residential areas have immediate access to Minor/Residential Roads but are distant from SR 241 and I-5
2. Arterials connect Minor/Residential Roads to SR 241 and I-5
3. Residential exit points are the points where Minor/Residential Roads intersect Arterials, thereby providing eventual access to SR 241

Analysis & Results

Analysis

Upon visual analysis, residential parcels in within the Combined Hazard Area were assigned to one of four categories:

1. One exit point with some distance to a single arterial

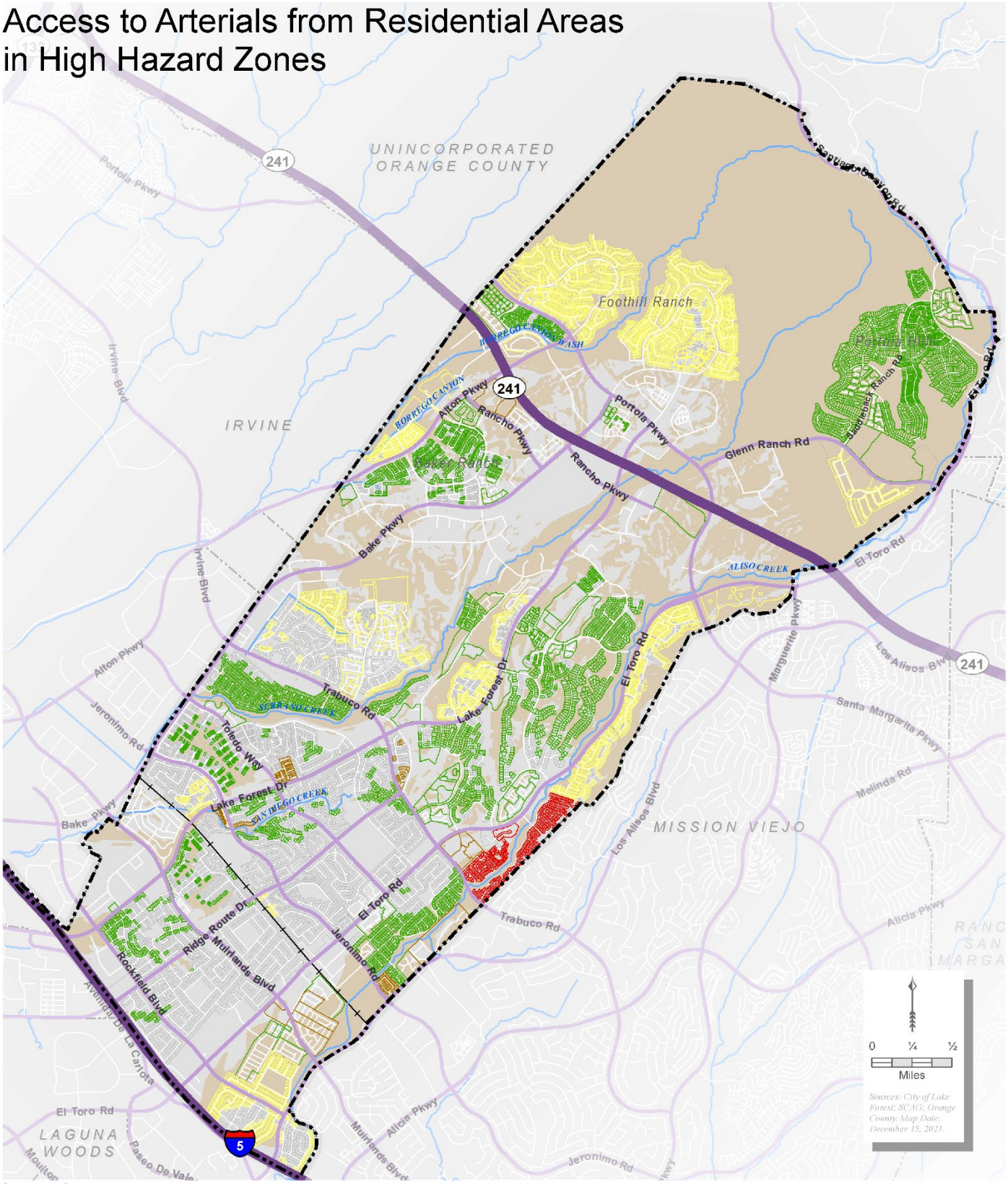
2. One exit point directly onto a single arterial
3. Multiple exit points with access to a single arterial (loop road)
4. Multiple exit points with access to multiple arterials

Results

The following neighborhoods (northeast of Trabuco Road and southeast of El Toro Road, near the city boundary) should be reviewed for adequate exit strategies:

1. One neighborhood of 307 single-family residential parcels (Pebble Creek Park area) must all exit the neighborhood via Creekside Dr to reach El Toro Rd
2. Another smaller neighborhood of single-family residential parcels (Woodside subdivision) must all exit via Manalastas Dr to reach Trabuco Rd
3. On the north side of the Aliso Creek, there are 79 single-family residential parcels (Bennet Ranch subdivision) that must exit via Cherry Ave to reach Trabuco Rd
4. The Aliso Park Community must all exit Aliso Parkway to reach El Toro Rd

Access to Arterials from Residential Areas in High Hazard Zones



Legend

- City of Lake Forest
- Combined Hazard Area

Roadway Hierarchy

- Interstate/State Routes
- Arterials
- Minor/Residential Roads

- Residential Parcels NOT within the Combined Hazard Area

Residential Parcels within the Combined Hazard Area

- One Exit Point with some distance to a Single Arterial
- One Exit Point directly onto a Single Arterial
- Multiple Exit Points with Access to a Single Arterial (Loop Road)
- Multiple Exit Points with Access to Multiple Arterials

Lake Forest 2040
Our Vision. Our Plan.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm