

Chapter 6

PUBLIC SAFETY

EMERGENCY SERVICES • ENVIRONMENTAL JUSTICE • CLIMATE CHANGE •
HAZARDS MANAGEMENT • WILDLAND FIRES • FLOOD CONCERNS • GEOLOGIC
AND SEISMIC CONSIDERATIONS • NOISE

VISION



Imagine Brea, where public safety is a high priority and residents feel protected from hazards. Imagine Brea, where proactive planning addresses how to mitigate hazards, such as crime, flood hazards, earthquake effects, urban and wildland fires, climate change, and noise exposure. Imagine rapid and effective emergency response. Imagine quiet residential neighborhoods designed to minimize traffic and other noise sources. Imagine urban and wildland fires quickly extinguished by a fire department that has superior personnel, equipment, and facilities to handle any fire.

One of the City's highest priorities is to ensure a safe and secure community. This Public Safety Chapter sets forth goals and policies to protect and safeguard Brea residents from wildland and urban fires, crime, hazardous materials incidents, flooding, earthquakes, exposure to the effects of climate change, and exposure to excessive noise levels. Brea will strive to be fully prepared for natural disasters and to minimize public exposure to hazards. Brea will maintain and enhance its emergency services to allow police, fire, and paramedics to respond swiftly to emergency situations. The City will maintain public safety facilities to improve public safety and protection.

EMERGENCY SERVICES AND SAFETY

One of the most fundamental qualities valued in Brea is the safety and well-being of its neighborhoods and businesses. Brea is highly regarded for its provision of quality, effective, community-oriented police and fire services, personnel, and volunteers. Brea will continue to sustain and improve its commitment to safety through a comprehensive approach to police and fire services, including public outreach and education, community awareness, and partnerships with public agencies and private businesses. Foresight and planning regarding land use decisions represent proactive approaches to enhancing safety in the community. Keeping neighborhoods buffered from both urban and wildland fire hazards reduces incidents requiring response and minimizes damage to property when fires do occur. Incorporating public safety considerations into the design of new buildings — allowing the community's "eyes on the street" to be the first defense against crime — creates safer environments. Ensuring public safety in Brea also requires understanding and planning for the effects of climate change and addressing public health risks and environmental concerns of those living in disadvantaged communities in the City. The Public Safety goals and policies reflect Brea's emphasis on preventing public safety problems rather than reacting to them.



Along with the regular duties of traffic and law enforcement, the Brea Police Department also has community outreach activities such as Business Watch, Commercial Video Partners, the Contact a Cop portal, Coffee with a Cop, National Night Out, Neighborhood Watch, Pay it Forward Patrol, Ride-a-Longs, Shop with a Cop, Vacation House Checks and station tours.

Context

The safety and well-being of the Brea community rely on police and fires services, addressing health risks and environmental justice concerns, and preparing for climate change impacts. The Brea Police and Fire departments provide invaluable life-saving services and are held in high regard for the high quality and commitment of their personnel.

Police Services

The mission of the Brea Police Department is to enhance safety and quality of life through smart, empathetic, responsive policing in partnership with the community. As such, the Brea Police Department is a highly valued positive force in the community, providing effective safety and emergency response services, but also engaging in community programs and educational activities. Forming lasting and meaningful partnerships with the community residents and business owners through volunteerism has always been a priority at the Brea Police Department. The Police Department includes a number of innovative, community-oriented services, including the Volunteers in Police Services (VIPS) Program, the Explorers Program, the Citizen’s Academy, the Community Watch, and several traffic safety programs.

The Police Department provides police services to more than 45,000 residents and a daytime population of more than 125,000 in the city of Brea. From the central station at the Brea Civic & Cultural Center and a substation in Downtown, the Department offers quick response to all community law enforcement needs.

Explorer Post

Initiated in 1969, the Brea Police Explorer Post, is designed to build confidence, instill respect for others and a sense of pride in achievement and community service. Brea Police Explorers are exposed to all aspects of police work in the city in a controlled and safe environment.

This training can prepare participants for a career in law enforcement and teach them valuable life skills. Explorers perform a variety of community services including traffic control, crowd control, fingerprinting, and assisting in emergency situations.

Citizen's Academy

The Citizen Academy is a one evening per week, ten-week program designed to give participants an up-close look at law enforcement. Taught by Brea police officers and civilian personnel who are experts in their particular discipline, this informal academy covers topics such as criminal law, patrol tactics, firearms, drunk driving enforcement, crime scene investigation, K9, SWAT and other important aspects of a police officer's duties. Many graduates of this unique program have embarked on a career in law enforcement or continue in a volunteer capacity for the City.

Community Watch

The Community Watch Program mobilizes volunteers in both residential and business communities who want to help make their community safer by partnering with members of the Brea Police Department. Community Watch is based on the successful Neighborhood Watch Program, which is one of the oldest and best-known crime prevention concepts in North America. Neighbors helping neighbors is the approach at its most fundamental level. Depending on the needs of the particular group, Community Watch members may patrol the areas they represent, distribute crime prevention information, participate in regular meetings to discuss area issues, manage phone, text, and/or email groups for quick dissemination of information, assist with emergency preparedness activities, or conduct business assessments.



Volunteers in Police Services (VIPS)

VIPS is a group of residents and business owners from Brea who augment the strength of the department by volunteering a minimum of 16 hours per month. VIPS duties include assisting with traffic and crowd control, proactive patrolling of community schools, businesses, and residential areas in specially marked and equipped cars, filing and answering telephones in the detective bureau, and assisting at crime scenes.



VIPS represent the Department at Downtown's Car Show.

Fire Services

The primary mission of the Brea Fire Services Department is the delivery of life safety services. The Department provides 24-hour emergency response to a wide spectrum of community situations, including fires, explosions, hazardous material incidents, medical emergencies, accidents, and general public assistance requests. The Fire Prevention and Emergency Preparedness Programs provide fire inspections, hazardous process permitting, fire code enforcement, public education, and business emergency planning. The Department also leads community outreach and volunteer programs, including the Fire Explorer Program and Community Emergency Response Team (CERT) program.



The Brea Fire Department has an internal equipment committee that identifies equipment needs, researches new equipment and tools, and makes recommendations for purchase. This applies to everything from small equipment to the purchase of new fire engines.

Each of the Department's stations is assigned to a Fire Management Zone, a geographically based area of responsibility that represents the station's primary assigned emergency response district. As new development occurs within the northern and eastern areas of Brea, the Department will need to continually assess the best approaches to serving new residents, including consideration of a new station or stations to maintain minimum response times.

Fire Explorer Program

Affiliated with the Boy Scouts of America, this program allows young men and women ages 14 to 19 to experience the career of a firefighter. Fire Explorers work under the supervision of career firefighters to learn emergency response services and prevention programs.



Community Emergency Response Team (CERT)

The Brea Community Emergency Response Team (CERT) Program educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills to assist their families and others in their neighborhood or workplace immediately following an event when professional emergency responders are not immediately available to help.

Fire Flow Analysis

To combat fire, the Fire Department must have sufficient water pressure and storage throughout the City to quickly extinguish urban and wildland fires wherever they arise. Insufficient water pressure can jeopardize fire fighting capabilities and allow fire to spread uncontrollably, causing excessive damage to structures. The fire flow analysis assesses the ability of the water system to meet fire flows throughout the planning area while also providing maximum day demands. The water system must be capable of providing at least 20 pounds per square inch residual pressure at one location in the entire water system.

The City has conducted many computer simulations of analysis and has recorded deficiencies only in Olinda Village. For most areas in Olinda Village, the pressures are adequate for all demand periods; however, higher elevation areas do not receive adequate pressure during higher demand periods and fire flows. The City has placed special requirements on landowners at the higher elevations to mitigate pressure problems. Prior to approving new development in remote areas in Carbon Canyon and Olinda Village, the City will study the requirement of any new booster pumps, storage tanks, sprinklers, and additional water facilities for new development. A new reservoir in the Carbon Canyon will help improve the low-pressure areas.

The Wildland Fires Section within this chapter discusses the protection and services against fires within the city and hillside areas. The Infrastructure Section in the Community Development Chapter discusses water distribution system and water storage capacity improvements.

**Emergency
Preparedness
Program**

Brea is well prepared to respond to all types of emergencies. The City's Emergency Preparedness Program addresses appropriate responses to major earthquakes, hazardous materials accidents, wildfire, and dam failure. The program describes how emergency response will be coordinated and how evacuation of residents will proceed. Program objectives include injury reduction and avoiding loss of life and property damage through effective management of emergency forces. Figure 1 shows the location and distribution of critical facilities, including fire and police stations, and energy utility lines. Brea Fire, which has four stations strategically located across the City, is an all-hazard agency with personnel trained to tackle a variety of incidents including fires, medical emergencies, traffic collisions, active shooter, police assists, and powerline problems. Figure 2 shows the location of water and wastewater utilities in the City. No areas in Brea have been identified as lacking emergency service.

**Environmental
Justice**

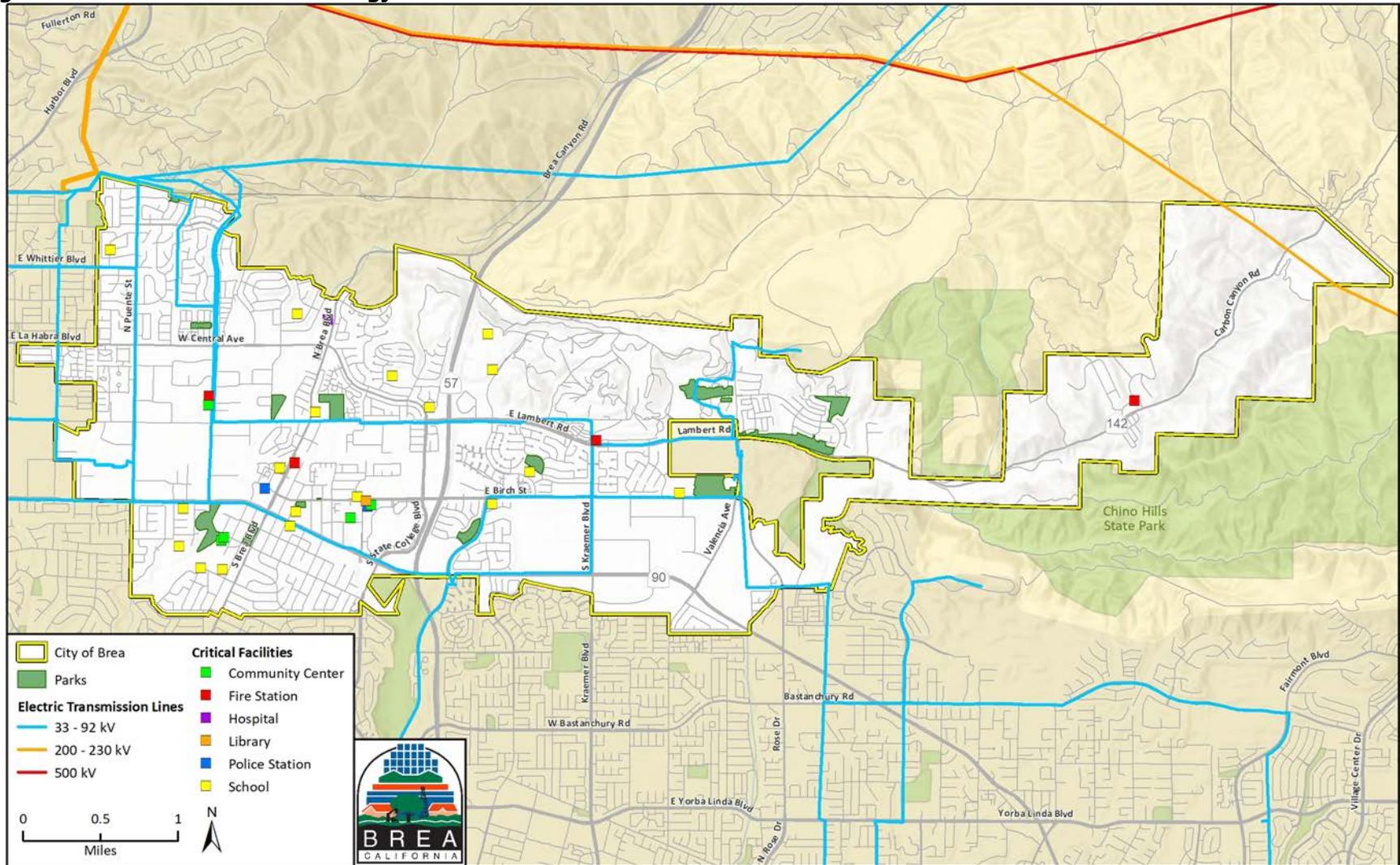
Senate Bill 1000 (SB 1000) requires cities with identified disadvantaged communities (DACs) to include environmental justice goals and policies in the General Plan. Per SB 1000, the California EPA uses CalEnviroScreen, a mapping tool to identify disadvantaged communities throughout the state. CalEnviroScreen uses a variety of statewide indicators to characterize pollution burden (the average of exposures and environmental effects) and population characteristics (the average of sensitive populations and socioeconomic factors). The model scores each of the indicators using percentiles and combines the scores for individual indicators to determine an overall CalEnviroScreen score for a given census tract relative to others in the state. Figure 3 shows the CalEnviroScreen results for Brea. Two census tracts in west Brea have a combined DAC score of 75% or higher, thus exceeding the minimum criterion for DAC designation. As mandated under SB 1000, this Public Safety Chapter includes policies to address environmental justice through reducing health risks to DACs, promoting civil engagement, and prioritizing the needs of these communities.

Climate Change

All communities in California will feel the effects of climate change over the next century. As required under Senate Bill 379, the City of Brea completed a local climate change vulnerability assessment, which concludes that Brea will be most vulnerable to extreme heats events, droughts, flooding, wildfires, and resulting decreased air quality conditions in a changing climate. As discussed in the vulnerability assessment, communities most affected by the effects of climate change in Brea are individuals with chronic health conditions and renters. This Public Safety Chapter includes policies to increase the community’s ability to cope with climate change impacts, also known as adaptive capacity.

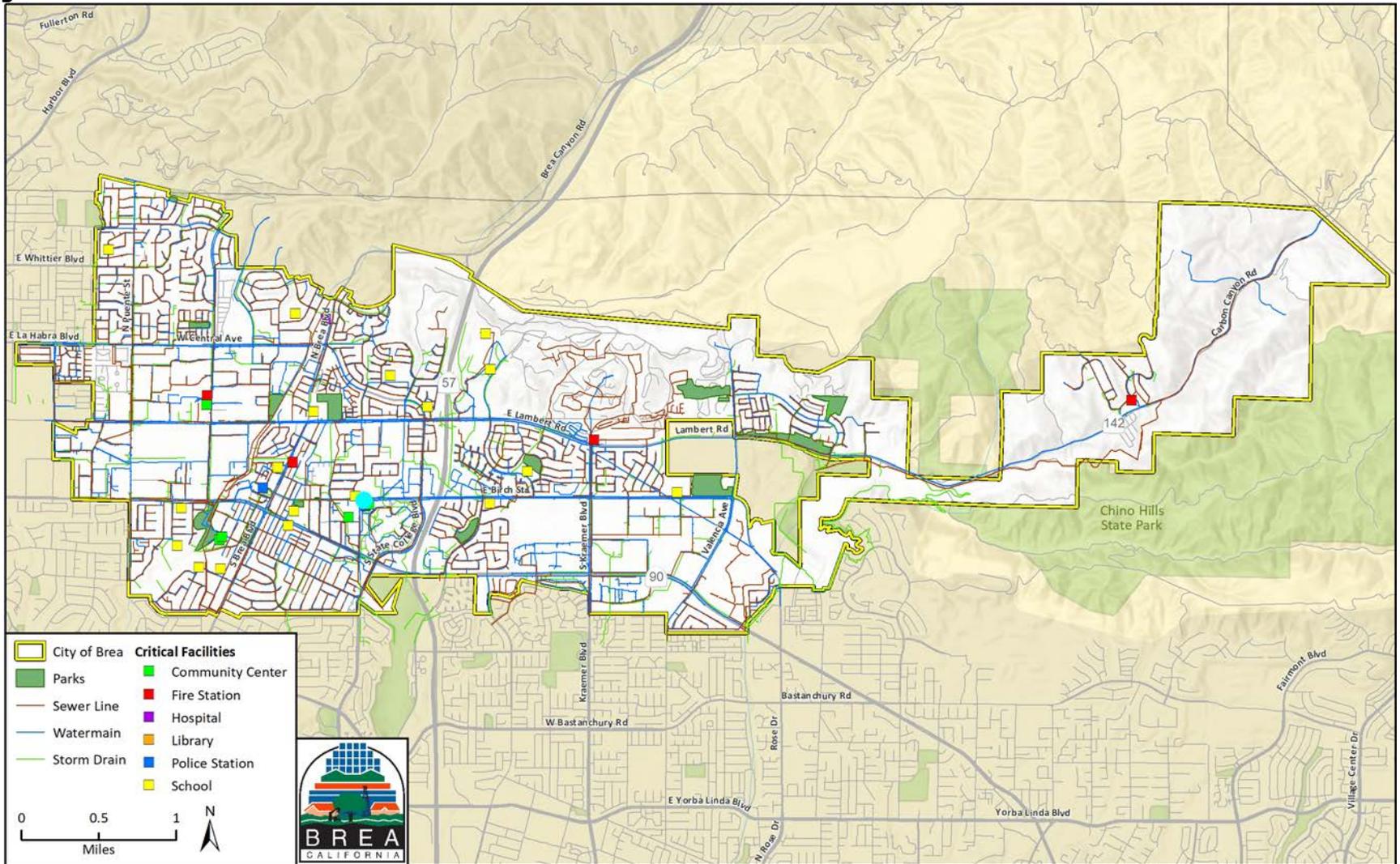


Figure 1. Critical Facilities and Energy Utilities



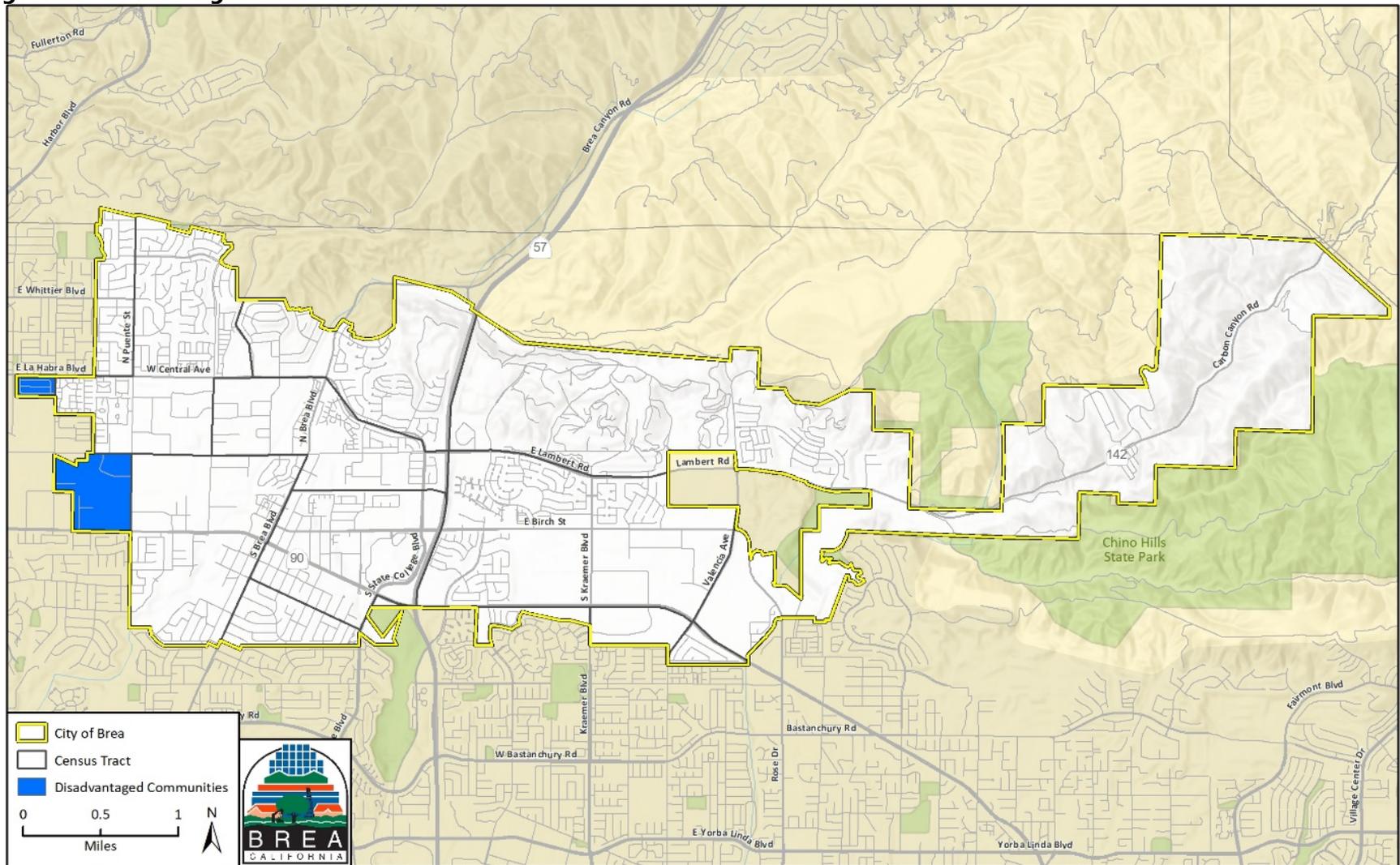
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Source: City of Brea, 2021; CEC 2021.

Figure 2. Critical Facilities Water and Wastewater Utilities



Imagery provided by ESRI and its licensors © 2021.
 Source: City of Brea, 2021; CEC 2021.

Figure 3. Disadvantaged Communities



Imagery provided by ESRI and its licensors © 2021.
Source: California Environmental Protection Agency, 2018.

Goals and Policies

Brea aims to build on its proven safety record by fostering safer neighborhoods through demand-responsive police and fire services, active enforcement, community involvement, and continued proactive public safety planning.

Goal PS-1	Provide the highest quality public safety services to the Brea community.
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- Policy PS-1.1 Work with the Police Department to determine and meet community needs for law enforcement services.
- Policy PS-1.2 Provide up-to-date technology to the Brea Police and Fire Department.
- Policy PS-1.3 Continue to maintain and develop a community-based police strategy compatible with the needs and size of the community.
- Policy PS-1.4 City Community Development to work with the Brea Fire Department to determine and meet community needs for fire protection and related emergency services. Ensure that sufficient stations, personnel, and equipment are provided to meet growth needs in the City.
- Policy PS-1.5 Maintain a maximum 4- to 6-minute emergency response time for fire safety services. Maintain a 3- to 5-minute response time from emergency police response services. Require that all new development be able to meet established standards for such response.
- Policy PS-1.6 Impose special conditions as needed on development projects to ensure that adequate fire protection measures are in place and maintained.
- Policy PS-1.7 Incorporate the tenets of Community Oriented Policing into the design of crime prevention and enforcement programs.
- Policy PS-1.8 Use technology to improve crime prevention efforts.

- Policy PS-1.9 Maintain and update, as appropriate, the City's emergency preparedness programs, plans, and procedures to ensure the health and safety of the community in the event of a major disaster.
- Policy PS-1.10 Support volunteer programs, after school activities such as DARE, police activities within high schools, and Neighborhood Watch programs.
- Policy PS-1.11 Ensure that local authorities have the necessary tools and education to cite and correct problems before they become safety issues.
- Policy PS-1.12 Incorporate health threats into early warning systems.
- Policy PS-1.13 Use federal, state, and regional resources, as they become available, to address localized exposure to elevated air pollutant levels, including in disadvantaged communities in west Brea.
- Policy PS-1.14 Maintain and periodically update Emergency Management Plans, including the Emergency Operations Plan, which includes training for City staff and volunteers on disaster recovery efforts such as debris removal and evaluating post-disaster re-development options. Each Brea Firefighter must complete 192 hours of annual training based upon ISO and OSHA requirements.
- Policy PS-1.15 Consider climate change vulnerability in planning decisions, including those involving new public facilities and private development.
- Policy PS-1.16 Ensure the reliability of essential facilities such as hospitals, and first-response buildings in the event of an emergency through promoting grid resiliency and energy independence. Work to implement on-site generation through photovoltaic systems and battery storage.
- Policy PS-1.17 Minimize risk of disease spread and economic disruption due to infectious disease.

Policy PS-1.18 Ensure access to essential resources and facilitate effective communication in the community to accelerate recovery following a disaster.

Policy PS-1.19 Promote inclusion of different socioeconomic groups in governmental processes, programs, and decisions.

**Implementation
Guide**



See Section XVIII in the Implementation Guide.

**Crime Prevention
through
Environmental
Design (CPTED)**

Secure streets and public places reduce the potential for criminal activity. One method of addressing crime prevention is defensible space planning. Defensible space planning uses design techniques, building orientation, and features of the built environment to deter criminal activity and positively influence human behavior and the perception of safety. Defensible space planning is a key element in a local comprehensive crime prevention and safety plan. CPTED techniques look to incorporate four key considerations into site planning and architectural design: territoriality, natural surveillance, activity support, and access control.¹

Territoriality

People tend to protect territory that they feel is their own and to respect the territory of others. Low decorative fences, artistic pavement treatments, well designed signs, good property maintenance, quality landscaping, and public art express pride in ownership and identify personal space.

Natural Surveillance

Placing physical features, activity centers, and people in ways that maximize the ability of passers-by to see what’s going on discourages crime. Barriers such as bushes, sheds, or shadows make it difficult to observe activity. Landscaping and lighting that promote natural surveillance from inside a home or building and from the outside by neighbors are effective means of passive crime prevention.



This supermarket uses landscaping, artistic treatments, walkways and lighting to reinforce territoriality and provide natural surveillance.

¹Basics of Crime Prevention Through Environmental Design. www.ncpc.org

Activity Support

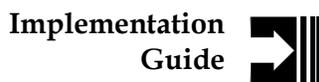
Encouraging legitimate activity in public spaces assists in discouraging crime. Improvements like a basketball court in a public park and community activities such as a clean-up day, block party, or civic or cultural event bring people out, get them involved, and help discourage vagrancy and potential illegal acts.

Access Control

Entrances and exits, pedestrian paths, and driveways can be located to direct people to safe, lighted, visible areas. Strategies include adding front porches or a front office to an apartment building, locating drive-up or walk-up business services in view of the street, and planting low-level landscaping along walkways.

Goal PS-2	Protect all persons and property from criminal activity through appropriate physical design
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- Policy PS-2.1 Develop defensible space guidelines to be used in the review of development proposals.
- Policy PS-2.2 Maximize natural surveillance through physical design features, including well-lighted driveways, walkways, and exteriors; visible entryways from surrounding structures and businesses; well-defined walkways and gates; and landscaping that does not obscure visibility.
- Policy PS-2.3 Ensure that community areas and amenities such as transit stops, sidewalks, plazas, and parks are appropriately lighted, free of hidden spaces, and patrolled.
- Policy PS-2.4 Practice active surveillance measures in certain areas such as parking structures.



See Section XIX in the Implementation Guide.

Pedestrian Safety

Hand-in-hand with the goal of creating a walkable city is the goal of creating safe streets and travel ways. People need to feel safe in their environment if they are to be encouraged to use trails, pedestrian paths, and sidewalks to move about the community.

Goal PS-3	Provide safe pedestrian environments citywide.
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| Policy PS-3.1 | Ensure that pedestrian safety is enhanced and maintained through the inclusion of well-designed streets, sidewalks, crosswalks, traffic control devices, and school routes throughout Brea. |
| Policy PS-3.2 | Require all developments to provide adequate safety lighting in pedestrian areas and parking lots. |
| Policy PS-3.3 | Provide shielded safety lighting along trails and other public and private walkways separated from a street. |
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**Implementation
Guide** 

See Section XVIII in the Implementation Guide.

HAZARDS MANAGEMENT

Our industrial processes have created a myriad of products and materials that make life easier. Unfortunately, many of these products and associated by-products present hazards to human health. The current regulatory environment provides a high level of protection from the hazardous materials manufactured within, transported to, and stored in Brea's industrial businesses. By recognizing these hazards and ensuring that an educated public can work with City officials to minimize risks associated with hazardous materials in the urban environment, Brea can create safe conditions citywide.

Context

Many industrial businesses and oil production and processing companies are permitted to store, transport, and handle hazardous materials in Brea. Businesses that handle and generate small quantities of hazardous materials include dry cleaners, auto repair shops, medical facilities, and photo processing centers. Larger businesses, primarily in the industrial areas, can generate large quantities of hazardous products.

Industrial Businesses

Hazardous materials are handled and stored on a number of properties in Brea, primarily in the western industrial districts. More than 130 small quantity generators produce between 100 and 1,000 kilograms of hazardous waste annually. Large quantity generators, of which several call Brea home, produce over 1,000 kilograms per year. Per federal law, all such businesses register with the Environmental Protection Agency (EPA).



Used oil and other hazardous waste can be dumped at the Household Hazardous Waste Collection Center in the city of Anaheim.

Although the use of hazardous materials is carefully regulated today, past activities have led to the contamination of several sites in the City. Contamination has resulted from leaking underground storage tanks, disposal of hazardous materials, and various industrial practices. These lingering conditions and the potential for accidents and spills from currently regulated businesses challenge the City to reduce risks and prepare for emergencies.

The Superfund Act is a federal law designed to protect the environment from risks created from previous chemical disposal practices. Eleven "archive" sites in Brea have been identified as Superfund sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Most are located in the western industrial section of City, although the Olinda Alpha landfill is included on the list. Archive status indicates that to the best of the EPA's knowledge, no immediate or long-term risks to human health or to the environment are associated with these sites.

The EPA has identified more than 20 facilities in Brea on the Toxic Release Inventory (TRI). These are sites that are known to release toxic chemicals into the air. The EPA closely monitors the emissions from these facilities to ensure that their annual limits allowed under federal regulations are not exceeded.

In the 1990s, the State of California's Department of Toxic Substances Control aggressively pursued a program to identify and force remediation of Leaking Underground Storage Tank (LUST) sites throughout the State. Some of these fuel leaks resulted in substantial soil and groundwater contamination. Over 50 sites in Brea identified as sources of industrial solvent or metals contamination have likewise been subjected to target clean-up efforts. Thus, the problems of past practices largely have been addressed. Focus instead has been turned toward avoiding future contamination.

The Environmental Health Division of Orange County implements the Hazardous Waste Inspection Program throughout County. The program ensures that all hazardous wastes generated by Orange County businesses are properly handled, recycled, treated, stored, and disposed. The Orange County Certified Unified Program Agency is the local administrative agency that coordinates the following six programs regulating hazardous materials and hazardous wastes:

- Hazardous Waste
- Underground Storage Tanks (UST)
- Aboveground Storage Tanks (AST)
- Hazardous Materials Disclosure (HMD)
- Business Plan
- California Accidental Release Program (CalARP)

Oil Fields

Historically, Brea was founded as an oil community. In Spanish, *brea* means tar, of which plenty was discovered in the hills above the town. Oil fields in Brea today contain producing wells and associated petroleum and natural gas facilities managed by a number of energy companies. Production levels fluctuate depending upon world energy prices. Many wells have been closed and abandoned after years of operation. Property owners continue to explore land use options for the hilly terrain. Land use policy limits development based on slopes and other property constraints. Should an owner pursue development, remediation will be necessary to clean the sites and render them suitable for housing. Remediation can include cleanup operations to remove soils contaminated with hazardous materials common to oil fields.



Sucker rod pumping unit extracting oil from a well in Tonner Canyon. Driven by a motor which turns a flywheel with a crank arm, the sucker rod pump can easily lift oil 10,000 feet or more.

Brea may continue to have oil wells and associated uses in its midst as long as production remains economically viable. The major area of potential of environmental concern is oil spills. Spills can occur adjacent to wells, at a storage tank, due to broken pipes, and during operation

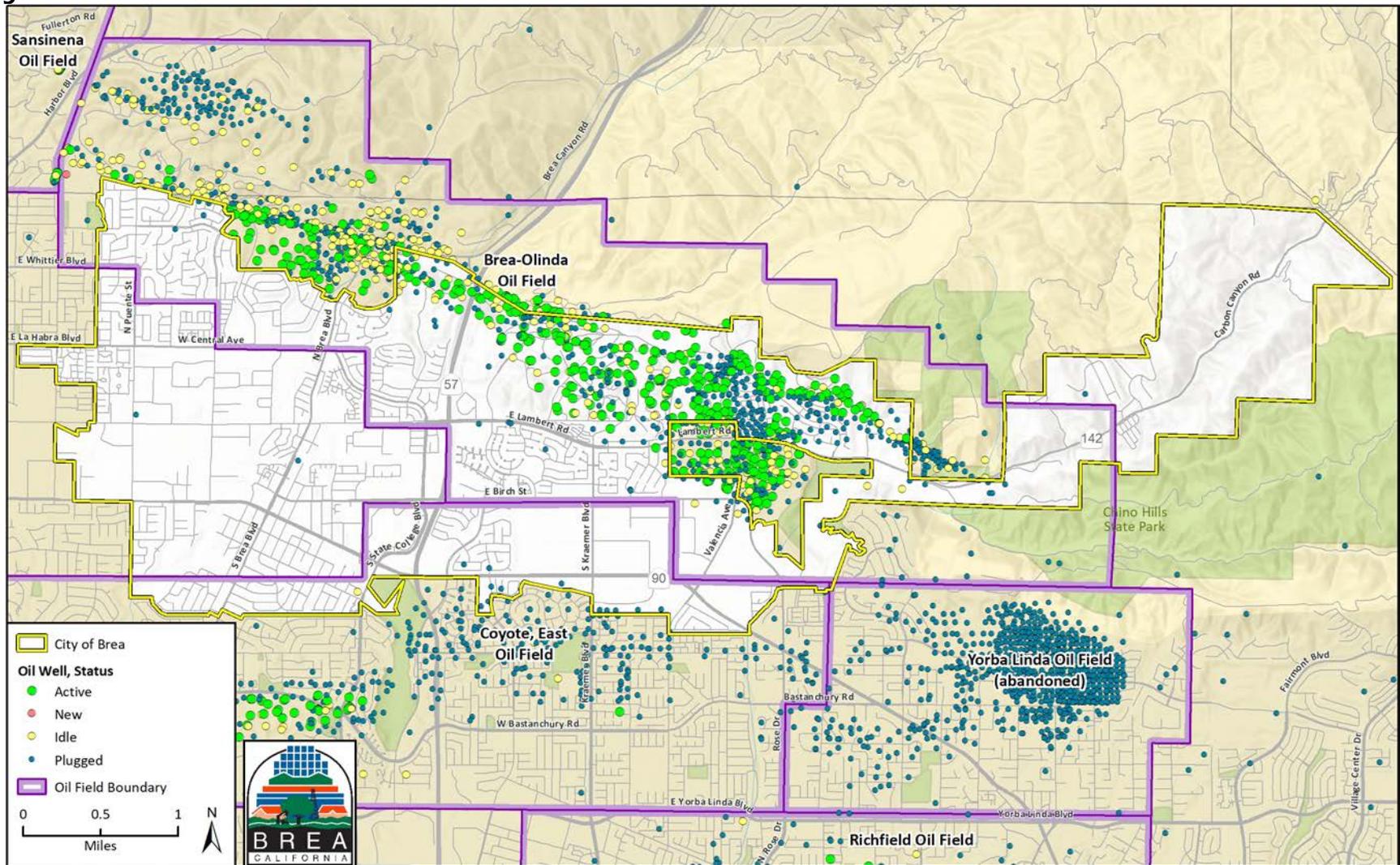
and maintenance. A secondary concern is explosions from gas plants and pressurized facilities.

Oil Seeps

The Brea-Olinda oil field, shown in Figure 4 and Figure 5, is one of the oldest producing regions in California. Natural oil seeps inspired early pioneers to drill for oil, leading to the discovery of the oil fields during the 1880s. Oil seeps are natural springs where liquid hydrocarbons (mixtures of crude oil, tar, natural gas, and water) leak out of the ground. Whereas freshwater springs are fed by underground pools of water, oil seeps are fed by natural underground deposits of oil.

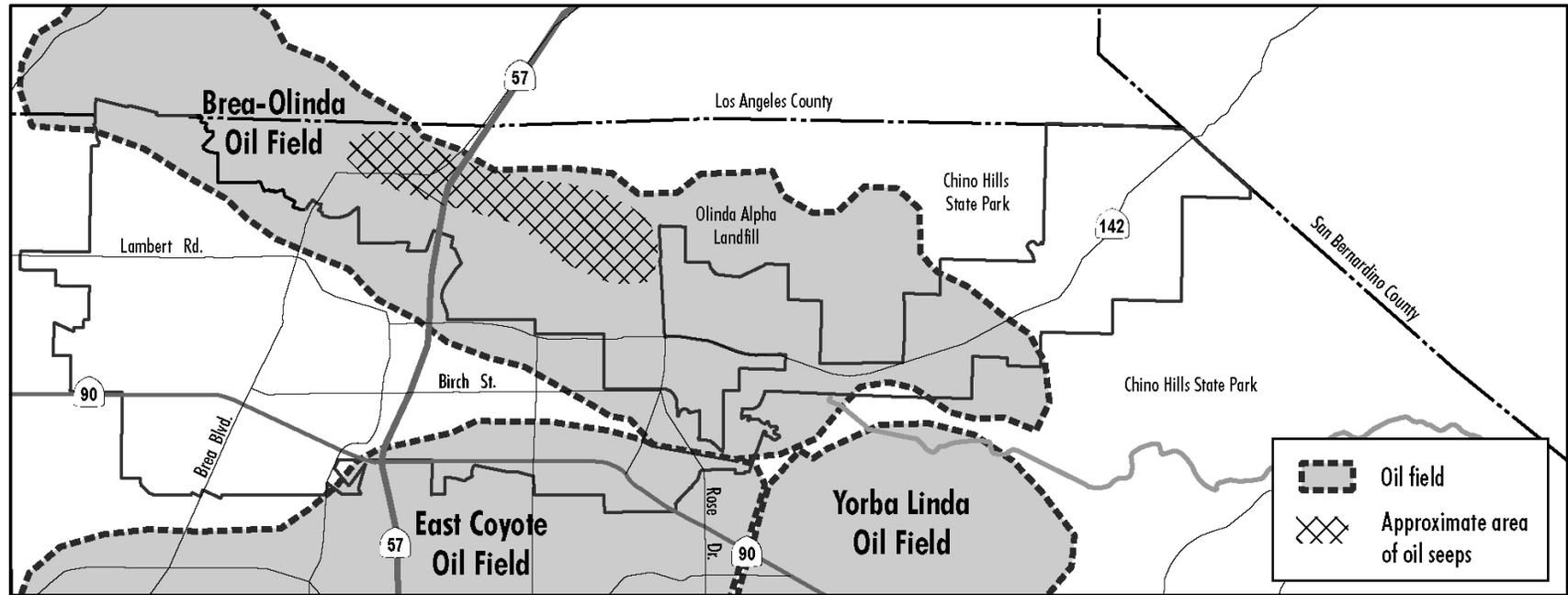
Unlike human-caused pollutants, most oil and gas seeps are produced by natural geologic processes that take place over millions of years. Though natural, they can nevertheless pollute air and watercourses. The emergence of oil seeps often occurs following a major earthquake. Oil seeps or concentrations of methane at explosive or near explosive limits can pose a constraint to development.

Figure 4. Location of Oil Wells and Their Status of Use



Imagery provided by ESRI and its licensors © 2021.
 Source: California Department of Conservation, 2020.

Figure 5. Oil Fields



Source: California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, 2002; U.S. Geological Survey, <http://seeps.wr.usgs.gov>, 2002.

Goals and Policies

Understanding the potential threat of hazards and creating safeguards to prevent accidents will ensure a level of safety for Brea residents and the community at large. The following goals and policies express the importance of working with and supporting other agencies that monitor and regulate hazardous waste and oil operations.

Goal PS-4	Protect the community from the hazards associated with the transportation, use, and storage of hazardous materials in the urban environment.
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| Policy PS-4.1 | Ensure that hazardous materials used in businesses and industry are handled properly. |
| Policy PS-4.2 | Reduce the risks associated with ground transportation hazards. |
| Policy PS-4.3 | Work with responsible Federal, State, and County agencies to identify and regulate the disposal of toxic materials. |
| Policy PS-4.4 | Provide education and information to City residents regarding the proper use and disposal of household hazardous materials. |

Goal PS-5:	Minimize the public's exposure to potential hazards associated with existing and abandoned oil facilities.
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| Policy PS-5.1 | Work closely with responsible State and Federal agencies to ensure that active oil field operations comply with all current regulations and, once oil field operations cease, that appropriate closure and clean-up activities occur. |
| Policy PS-5.2 | Continue to support the regulations of the California Division of Oil, Gas, and Geothermal Resources regarding abandoned oil facilities. |
| Policy PS-5.3 | Require comprehensive investigation, disclosures, and remediation of any former oil field property proposed for an alternative use. |

Imagine Brea

**Implementation
Guide**



See Section XIX in the Implementation Guide.

WILDLAND FIRES

Wildland fires pose a major threat to isolated development located within hillside areas and also to residential development along the fringes of the hillsides. During the summer season, dry vegetation, little seasonal rain, and Santa Ana wind conditions can combine to increase the likelihood of fires. Understanding the risks associated with development in and near fire-prone areas can help advance planning to reduce the risks associated with major wildland fires.

Context

A significant portion of Brea's sphere of influence and surrounding area remains undeveloped and consists of rugged topography with highly flammable vegetation. The woodlands, grasslands, and chaparral areas, while providing important open space, natural resources, and scenic qualities, also create fire hazards when development is located in or adjacent to these areas. Historically, wildfires have occurred in Carbon Canyon and in Chino Hills State Park. In 1926, lightning struck in the Union Oil fields and started an oil fire that burned for one week and cost an estimated \$7 million dollars. In 2008, the Freeway Complex Fire started as two separate fires: The Freeway Fire and the Landfill Fire, also known as the Brea Fire. The Freeway Fire ignited along the Riverside Freeway in the riverbed of the Santa Ana River in Corona and the Landfill Fire started near the 1900 block of Valencia Avenue in Brea, just south of the Olinda Landfill. The fires merged and destroyed residences in Olinda Village along Carbon Canyon Road in Brea. The fire burned over 30,000 acres and caused the closure of many schools, including those in the Brea Olinda Unified School District and approximately 40,000 people were evacuated from Anaheim, Carbon Canyon, Chino Hills, Corona, Diamond Bar, and Yorba Linda. Fires that occurred in and immediately surrounding Brea since the 1920's are mapped in Figure 6, those that burned between 1980 and 1999 are shown in Figure 7 and those that occurred between 2000 and 2020 are displayed in Figure 8. The California Department of Forestry and Fire Protection (CalFire) has identified Very High Fire Hazard Severity Zones (VHFHSZ) in Brea. VHFHSZs include the northernmost end of the City limits and north of East Lambert

Road. Figure 9 shows the Fire Hazard Severity Zones and critical facilities in the City.

Wildland fire is a natural process. In the past, the presumption has been that all fire is bad and should be extinguished promptly. This has caused vegetation to grow more densely, which ultimately weakens plants in a struggle for living space and increases destruction by pests and disease. Similar to fire suppression, climate change has the potential to affect the wildfire system, including fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create high fire risk and increased temperatures may intensify wildfire danger by warming and drying vegetation. Finding the balance between accommodating nature's course and protecting people and property from fire's destructive forces presents a continuing challenge to government agencies.



Fires usually last only a few hours or days, but their effects can last much longer. An intense wildfire may destroy all the vegetation. Fire also destroys most of the roots that hold the soil in place, allowing running water to wash the soil away. As a result, even normal rainfall can cause exceptional erosion, flooding, and sediment flows from a burned area.

Fire Hazard Severity Zones

The City has developed wildland interface construction and development standards for all new structures built within the High Fire Hazard Severity Zones and Very High Fire Hazard Severity Zone, as defined by the California Department of Forestry and Fire Protection (CAL FIRE). Examples of such construction requirements include:

- Automatic fire sprinkler system
- Class A roof covering
- Exterior wall surface made of one-hour fire rated materials
- Spark arrestor on chimneys
- Site landscape fuel modification

The Brea Fire Department has also developed standards to accommodate all types of fire apparatuses utilized by the Brea Fire Department, circulation and street design, and water system requirements for all new development proposed in the High Fire Hazard Severity Zones and Very High Fire Hazard Severity Zones.

Site Landscape Fuel Modification Zones

A fuel modification zone is the area of land directly adjacent to a building where combustible vegetation has been removed or modified or both and partially or totally replaced with drought-tolerant, fire-resistant plants to provide an acceptable level of risk from wildland fires. Fuel modification reduces radiant and convective heat, thereby providing fire suppression forces a safer area in which to take action. The Brea Fire Department has set a minimum distance of 170 feet beyond the construction boundary of any property on which a new structure can be built as its fuel modification zone within the designated High Fire Hazard Severity Zones and Very High Fire Hazard Severity Zones. The new fuel modification installation consists of:

- 20-foot Level Structure Setback (Zone A)
- 50-Foot Re-planting Irrigated (Zone B)
- 50-Foot Vegetation Thinning (Zone C)
- 50-Foot Vegetation Thinning (Zone D).

The best proactive measure homeowners can pursue to reduce the risks wildland fires is to maintain a fuel modification and vegetation clearance zone around structures consistent with Fire Department regulations, and to plant landscaping that can slow a fire's advance.

Fire Fighting Resources

The level of hazard to life and property is affected not only by the fire itself but by road access for evacuation, the number of available firefighters, vegetation clearance around property, availability of water and water pressure, and the effectiveness of building codes and inspection of developments in High Fire Hazard Severity Zones and Very High Fire Hazard Severity Zones.

Station 4 is located at 198 Olinda Place to enhance response to fires in areas accessible directly via Carbon Canyon Road. During fire season, the station's staffing levels are often enhanced to ensure adequate response. However, should development levels increase within Carbon Canyon or other hillside areas within or adjacent to High Fire Hazard Severity Zones and Very High Fire Hazard Severity Zones, increased response capabilities will become necessary.

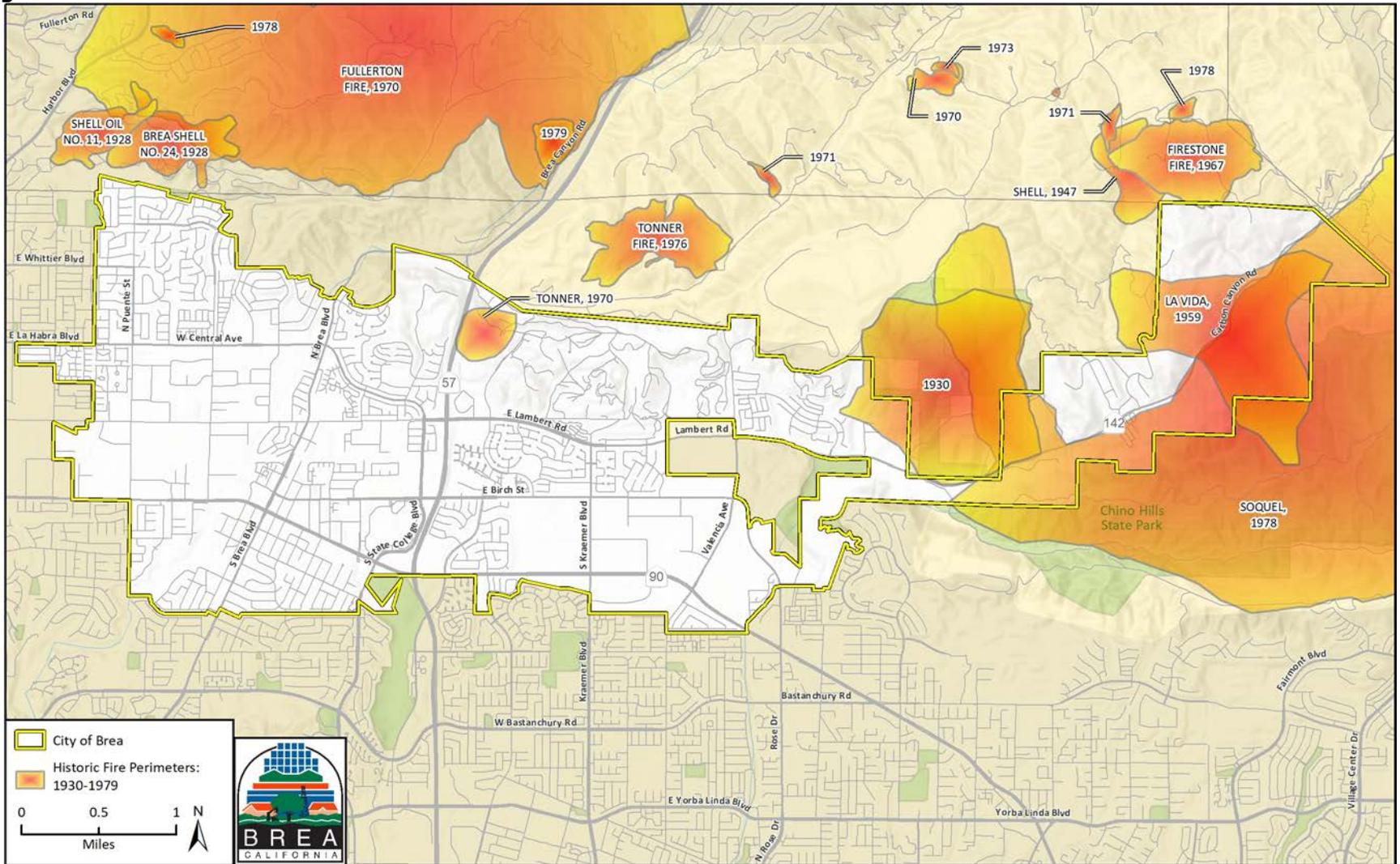
The Brea Fire Department works collaboratively with the Orange County fire service during emergencies and participates in the California Master Mutual Aid System. Mutual aid is emergency assistance that is dispatched upon request across jurisdictional boundaries. The Emergency Services and Safety Section within this chapter discusses fire flow analysis and adequate water pressure to combat urban and wildland fires within Brea's Planning Area.

Emergency Evacuation

Carbon Canyon Road and the 57 are critical for evacuation from many areas of the City. Wildfires and other hazards, such as flood events, can isolate areas of the City and create severe health and safety risks. Senate Bill 99, adopted August 2020, requires identification of neighborhoods that have fewer than two emergency evacuation routes. All neighborhoods in the City have more than one emergency evacuation route, however there are some neighborhoods located in north and east Brea which are of concern regarding emergency evacuation. These areas include Blackstone, Olinda Village, Olinda Village and south of Olinda Village, and Heritage Hills Neighborhood, shown in Figure 10. Although each of these neighborhoods have at least two emergency evacuation routes, some areas within the neighborhood could be isolated in the event of a wildfire. Figure 10 shows the neighborhoods of concern and indicates their entry and exit points. The Safety Element includes a variety of policies to increase resilience to wildfire in the community, including in these neighborhoods of concern which are in or surrounded by Very High Fire Hazard Severity Zones.

Assembly Bill 747, which will go into effect January 1, 2022, requires cities to evaluate route capacity, safety, and viability under a range of emergency scenarios. This requirement will be addressed in an annex to the City's Emergency Operations Plan. The Emergency Operations Plan is a cooperative effort between all City of Brea departments and agencies that have an emergency response role. The Plan establishes a comprehensive framework of policy and guidance for emergency and disaster response operations. The Plan also details capabilities, authorities, and responsibilities for specific individuals, divisions, departments, agencies, and organizations within the City of Brea.

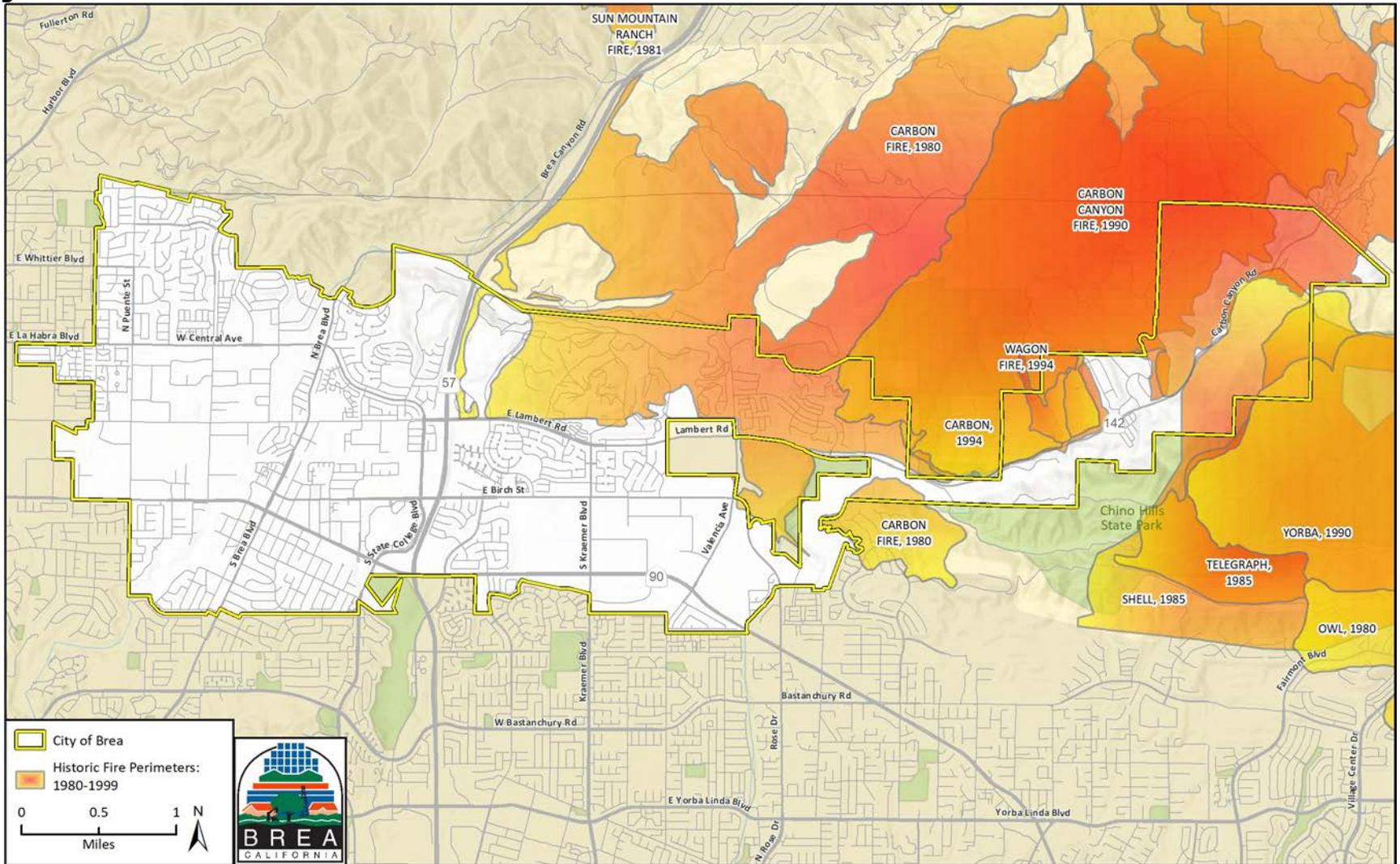
Figure 6. Historical Fires 1920 – 1979



Imagery provided by ESRI and its licensors © 2021.
 Source: CalFIRE, 2020.

Fig 7 Historic Fire Perimeters pre1980

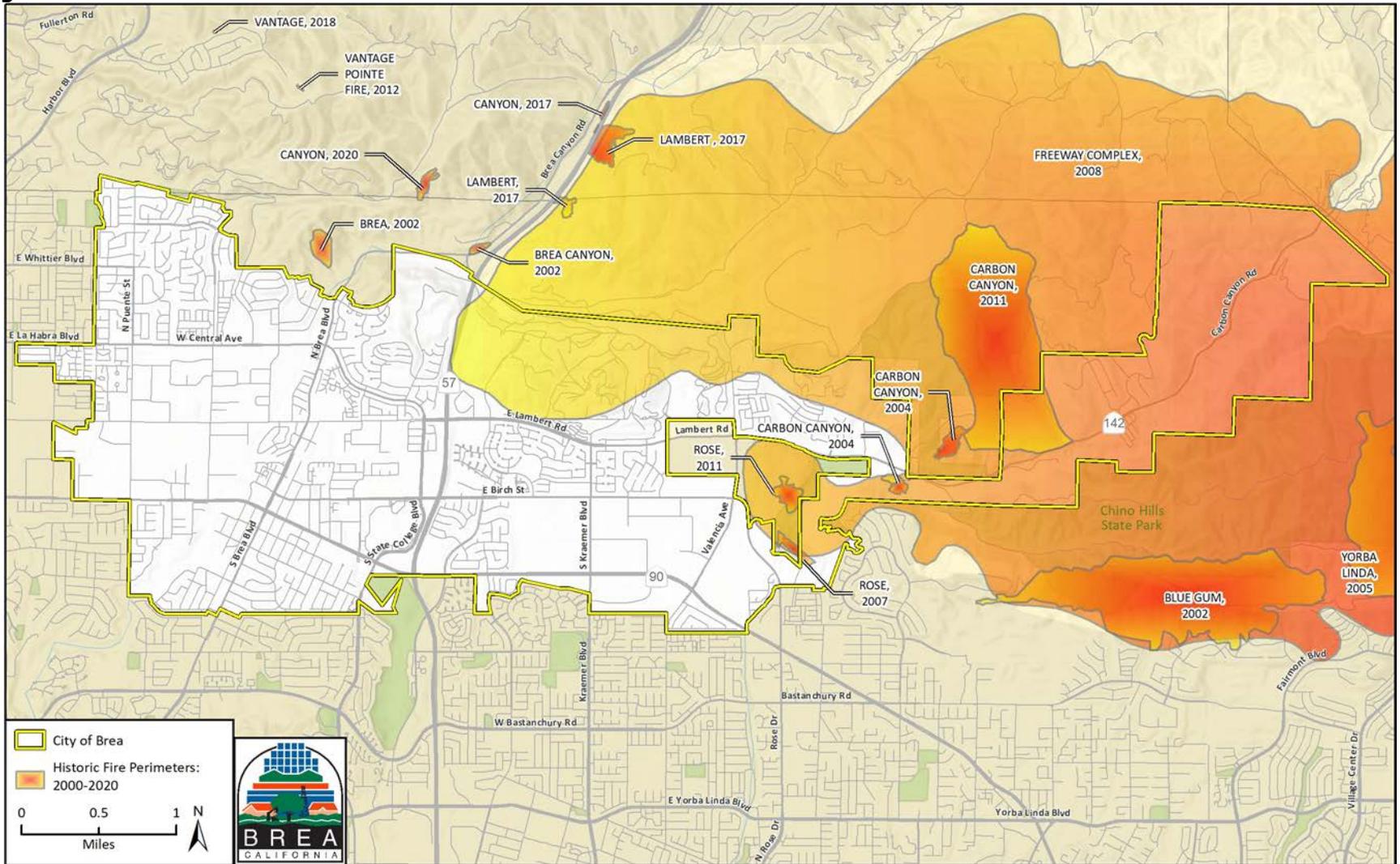
Figure 7. Historical Fires 1980 – 1999



Imagery provided by ESRI and its licensors © 2021.
Source: CalFIRE, 2020.

Fig 7 Historic Fire Perimeters 1980_1999

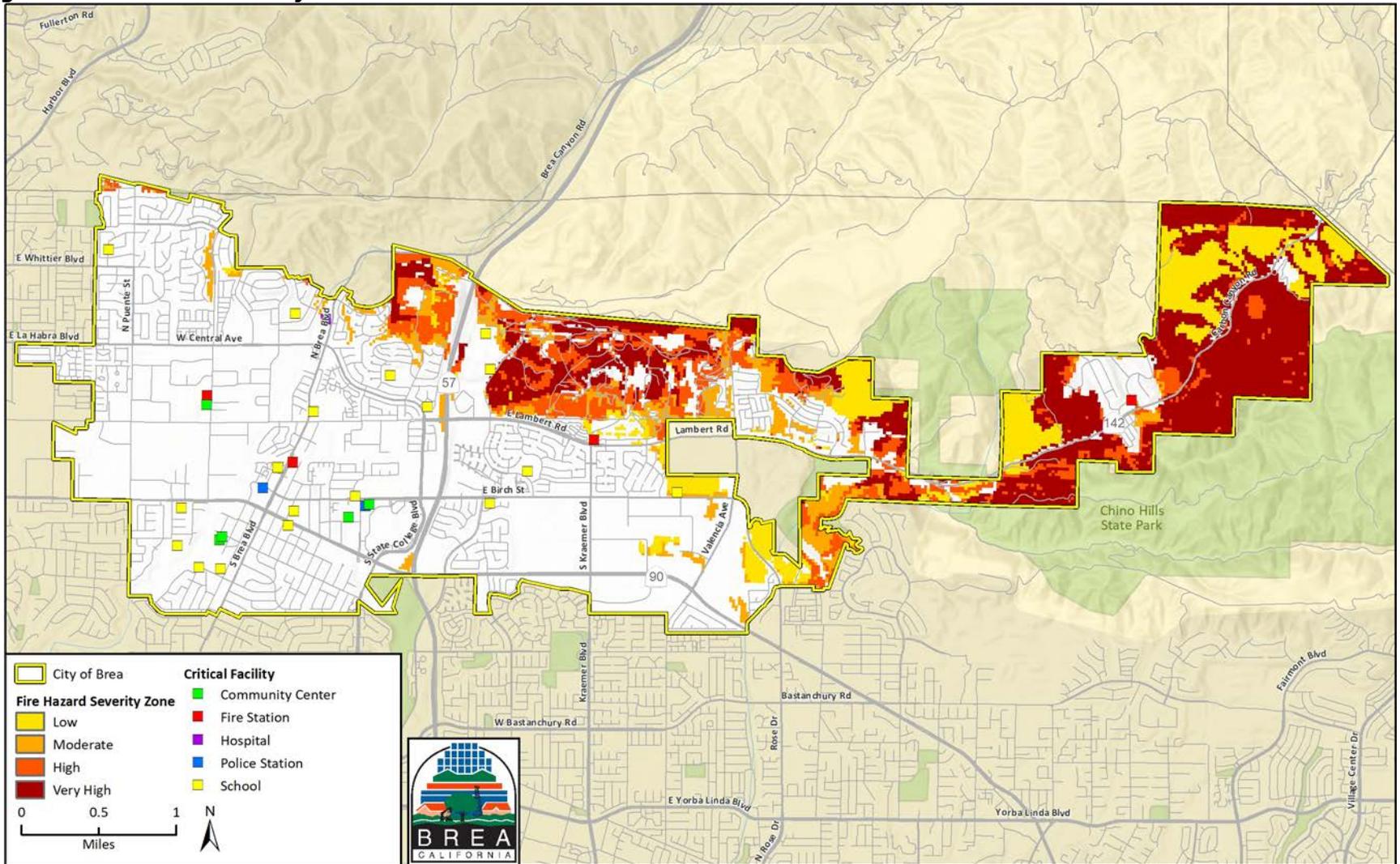
Figure 8. Historical Fires 2000 – 2020



Imagery provided by ESRI and its licensors © 2021.
Source: CalFIRE, 2020.

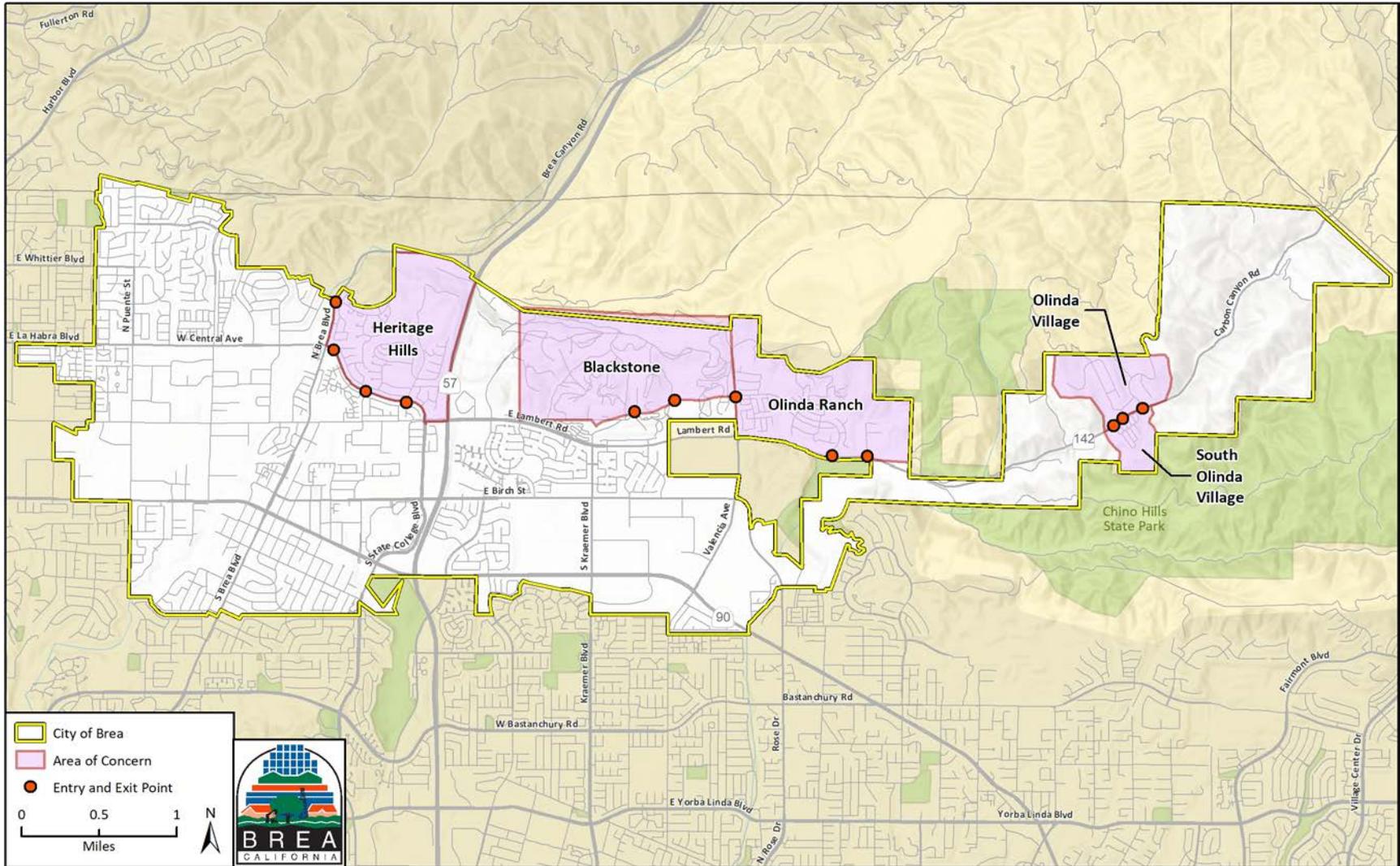
Fig 7 Historic Fire Perimeters 2000_2020

Figure 9. Fire Hazard Severity Zones



Imagery provided by ESRI and its licensors © 2021.
 Source: California Environmental Protection Agency, 2018.

Figure 10: Emergency Evacuation Access



Imagery provided by ESRI and its licensors © 2021.
 Modified neighborhood data provided by City of Brea, 2021.

Goals and Policies

New development will create increased fire hazards due to higher levels of interactions between open grassland and residential development. The City will continue to reduce the potential for dangerous fires by coordinating with the Orange County Fire Authority and the Carbon Canyon Fire Safe Council to implement fire hazard education, fire protection, and fuel modification programs, and to make sure that the city maintains sufficient emergency capacity, as described in the November 2015 County of Orange & Orange County Fire Authority Local Hazard Mitigation Plan, March 2017 Carbon Canyon Community Wildfire Protection Plan and April 2017 County-wide Community Wildfire Protection Plan covering Orange County, California. As of 2021, the City is beginning the process of developing the Brea Local Hazard Mitigation Plan, which will address hazard vulnerabilities and identify mitigation actions that the City will pursue in order to reduce the level of injury, property damage, and community disruption from natural and human-made disasters. In addition, the City will work closely with the local water districts and the County to ensure that water pressure is adequate for fire fighting purposes. Development proposals within high fire areas will be required to provide appropriate and adequate safeguards and response capabilities to prevent the loss of structures and to ensure established development does not experience reduced service. New development may be required to fund new fire facilities or equipment toward this end.

Goal PS-6	Protect the community from wildland fires.
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Policy PS-6.1 Encourage residents to plant and maintain fire-retardant slope cover to reduce the risk of brush fire in areas adjacent to the canyons, and develop and implement stringent site design and maintenance standards for areas with high fire potential.

- To the extent possible, native, non-evasive plant material are encouraged.
- Policy PS-6.2 Assure provision of adequate fire equipment access and fire suppression resources to all developed and open space areas.
- Policy PS-6.3 Continue to coordinate with community stakeholders and experts during fire planning efforts.
- Policy PS-6.4 Continue to coordinate with the County of Orange, the Orange County Fire Authority and the Carbon Canyon Fire Safe Council to include Brea in updates to the Local Hazard Mitigation Plan and Community Wildfire Protection Plan and investigate the possibility of preparing a plan component specific to the Brea community.
- Policy PS-6.5 Minimize risks to existing development in Very High Fire Hazard Severity Zones by identifying existing non-conforming development to contemporary fire safe standards, in terms of road standards and vegetative hazard, and requiring all development to meet or exceed the City of Brea Ordinance 1211 under the Brea Municipal Code and applicable updates.
- Policy PS-6.6 Minimize new development in the Very High Fire Hazard Severity Zone; and, when feasible, locate all new essential public facilities outside of the Very High Fire Hazard Severity Zone. Require fire protection plans for new development in the Very High Fire Hazard Severity Zone.
- Policy PS-6.7 Encourage and educate residents to maintain emergency supplies to last at least three days.
- Policy PS-6.8 Explore possible programs that would enable, encourage, or require landlords, property managers, and realtors to provide information to new tenants and new homeowners about emergency preparedness, evacuation routes, and home safety.

- Policy PS-6.9 Establish community facilities that can be used as a designated cooling, heating, or smoke relief center during wildfires and additional disasters.
- Policy PS-6.10 Designate and publicize evacuation routes.
- Policy PS-6.11 Plan transportation routes and transit systems, using contractors or City transit vehicles, that can support residents and visitors during evacuation situations, placing emphasis on vulnerable populations including the elderly, persons with chronic health conditions, and low-income and disadvantaged communities in the City.
- Policy PS-6.12 Maintain and update an Evacuation Plan every 8 years at minimum to account for all types of emergencies.
- Policy PS-6.13 Develop and employ evacuation alternatives and/or alternative emergency access routes in neighborhoods that have single ingress/egress.
- Policy PS-6.14 Designate safety zones or shelter-in-place locations as places of refuge when evacuation routes become blocked.
- Policy PS-6.15 Maintain emergency roadways and improve them as necessary and appropriate to ensure ongoing serviceability.
- Policy PS-6.16 Public Works Water Division to support the provision of adequate water availability throughout the City and provision of adequate water storage to meet future peak fire demand during times of peak domestic demands.
- Policy PS-6.17 Prior to approval of new development in remote areas in Carbon Canyon and Olinda Village, the City will study the requirements of any new booster pumps, storage tanks, sprinklers, and additional water facilities to ensure adequate water pressure during peak demand.
- Policy PS-6.18 Require new development to meet or exceed hardening requirements in Chapter

7A of the California Building Code, and provide adequate access (ingress, egress), including a minimum of two roadways with widths and lengths in compliance with the City of Brea Ordinance 1211 under the Brea Municipal Code and applicable updates.

- Policy PS-6.19 Brea Fire and Brea Public Works to establish and maintain community fire breaks and fuel modification/reduction zones, including public and private road clearance in coordination with Brea Public Works and Brea Fire.
- Policy PS-6.20 The City's development standards which meet or exceed State fire regulations are outlined in the City of Brea Ordinance 1211 under the Brea Municipal Code and applicable updates.
- Policy PS-6.21 Continue annual public information programs that explain the City's Emergency Preparedness Program and other emergency preparedness strategies, including defensible space and evacuative routes, focusing on the most vulnerable communities such as those in the Very High Fire Hazard Severity Zone.
- Policy PS-6.22 Establish higher standards of defensible space for residential neighborhoods in the Very High Fire Hazard Severity Zone.
- Policy PS-6.23 Require that all homes and businesses have visible street addressing and signage.
- Policy PS-6.24 Maintain mutual aid agreement with the State including for disaster response and evacuation assistance.
- Policy PS-6.25 Complete and periodically update the Standards of Cover assessment to assess current emergency service and project future emergency service needs. Update the Emergency Operations Plan as needed based on the results of the assessment.
- Policy PS-6.26 Research and develop general rules and procedures that would govern planning and

permitting requirements for construction of temporary housing or permanent rebuilding activities following a wildfire disaster, such as model emergency or urgency ordinances. This may also need to include staffing and tools needed to facilitate unique permitting needs in the recovery phase. Re-development required to build to current fire code and building standards

Policy PS-6.27 Evaluate evacuation route capacity, safety, and viability under a range of emergency scenarios as an annex to the Emergency Operations Plan, in accordance with AB 747.

Implementation Guide



See Section XX of the Implementation Guide for action programs

FLOOD CONCERNS

Portions of Brea are susceptible to limited but credible flood events from either a major storm or dam failure resulting from a significant earthquake. Recognizing and preparing for such occurrences allow Breans to avoid associated dangers.

Context

Brea has a history of major flooding in the past, but comprehensive storm drain improvements and the construction of Carbon Canyon Dam in 1961 have reduced the threat of floods, but not entirely. An unusually large storm and flash flooding can create flooding hazards within the City.

Storm Flooding

The unpredictable seasonal range in rainfall that is typical of coastal southern California, coupled with geographic and geologic conditions, makes Brea vulnerable to flooding during the winter storm season. The Orange County Flood Control District has constructed and maintains several improved flood control channels within Brea, most notably Brea Creek Channel west of and parallel to Brea Boulevard (see Figure 11) and the Loftus Channel east of SR-57, below Birch Street. The Brea Creek Channel captures and conveys significant runoff from the hillsides. Any new development that would affect the volume or speed of runoff within creeks tributary to the Brea Creek Channel would be required to ensure that channel capacity and function be maintained to protect adjacent and downstream properties.

The City participates in the National Flood Insurance Program. Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency, or FEMA, show potential flood zones for the 100-year and 500-year flood zones.² Figure 11 indicates the location of 100-year flood zones (1% annual flood risk), base flood plain, and areas of minimal flood hazard. The area upstream from Carbon Canyon Dam shown in Figure 11 is open space specifically designed and intended to accommodate flood waters.

² These are floods that, respectively, have a 1 percent and 0.2 percent chance of occurring every year.

Dam and Reservoir Failure

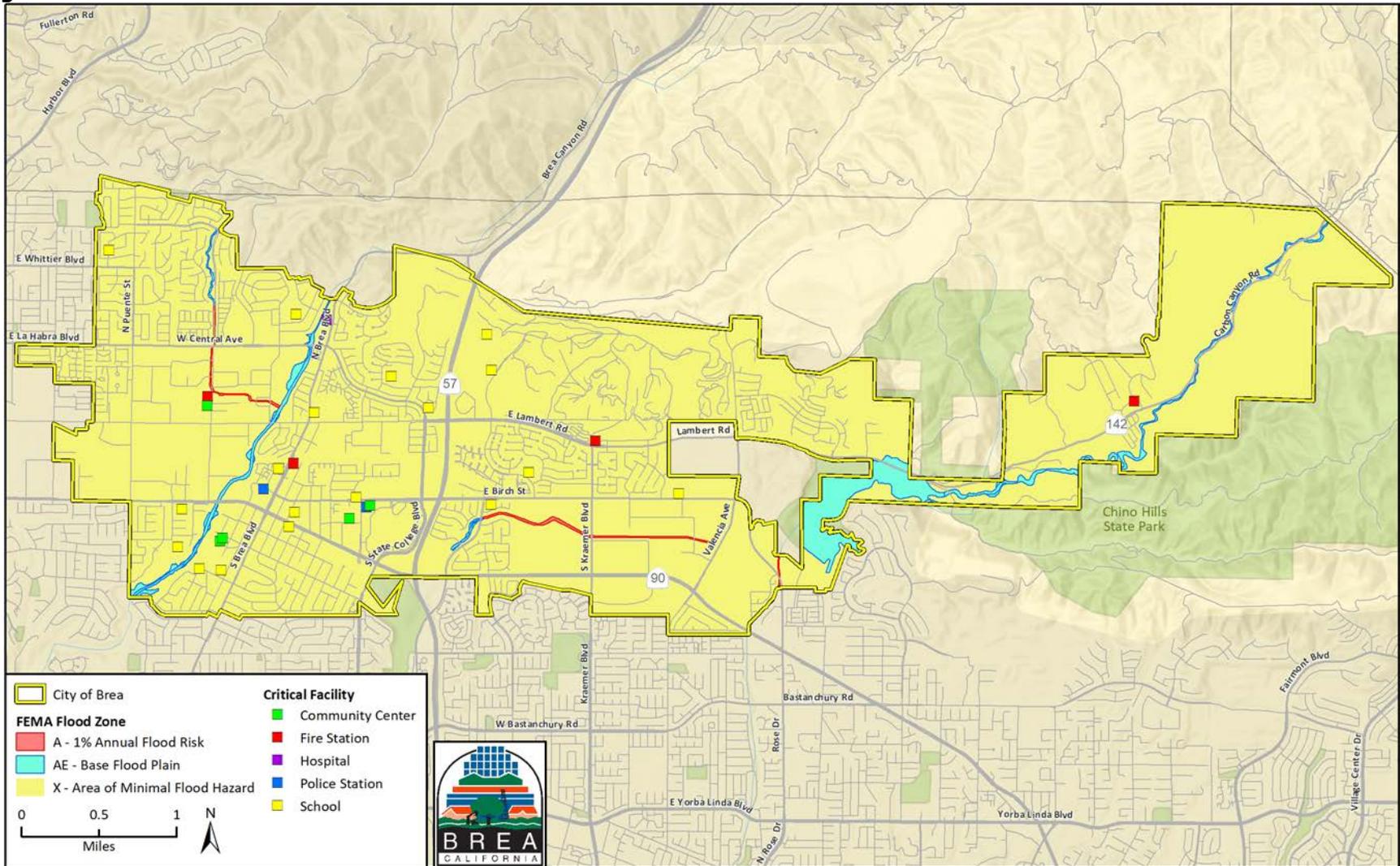
The two dams located within the Brea planning area, Carbon Canyon Dam and Orange County Reservoir, provide valuable flood control and water storage functions. Carbon Canyon Dam retains water over a 221-acre area and has a capacity of 7,033 acre-feet.³ Carbon Canyon Dam is vital for the flood protection of portions of the coastal plains in Orange County, including the cities of Fullerton, Placentia, and Anaheim. The U.S. Army Corps of Engineers is responsible for the dam's safety and conducts inspections on a regular basis. In the unlikely event of dam failure due possibly to an earthquake, areas below the dam would be flooded to the extent illustrated in Figure 12.

Orange County Reservoir, used for water storage, is owned by the cities of Brea (40%), La Habra (20%), and Fullerton (40%), and is operated by the Metropolitan Water District. The reservoir covers 7 acres and has a capacity of 217 acre-feet. Like Carbon Canyon Dam, this dam receives periodic inspections. The flood inundation path (Figure 12), should the dam fail, would affect largely residential properties.

Five reservoir tanks in the hills above Brea contain a total of 67.3 million gallons of domestic-use water. All but the Valencia reservoir have been built consistent with up-to-date seismic codes.

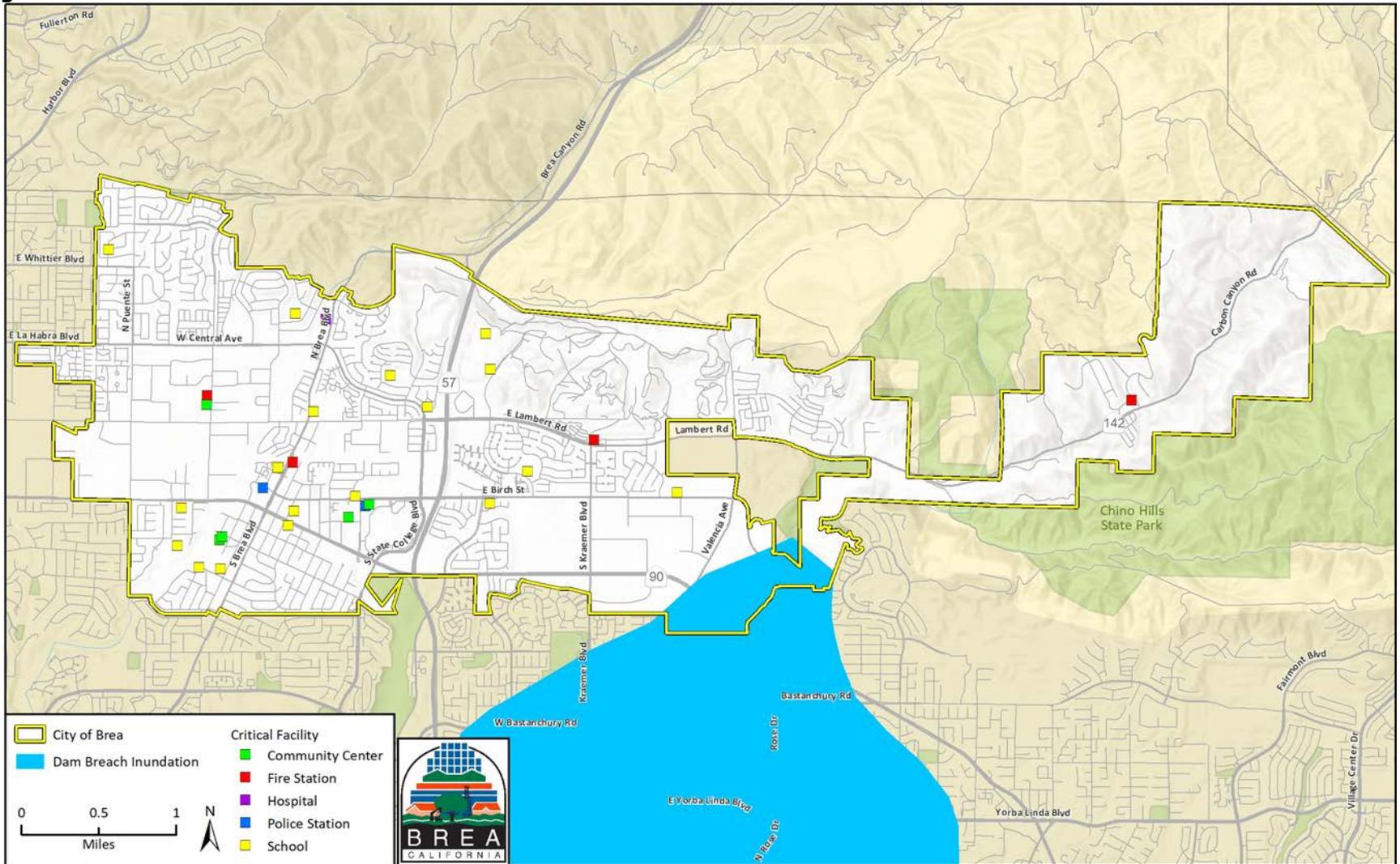
³ One acre-foot equals 325,851 gallons.

Figure 11. Flood Hazard Zones



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Source: Federal Emergency Management Agency, 2020.

Figure 12. Location of Reservoirs and Dams and Flood Plain and Dam Inundations Areas



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Source: Department of Water Resources, 2018.

Goals and Policies

Brea will strive to protect residents and the community at large from flood hazards.

Goal PS-7:	Reduce the risk to the community from flooding hazards.
-------------------	--

Policy PS-7.1: Cooperate and work with the Orange County Flood Control District to ensure District flood control facilities are well maintained and capable of accommodating, at a minimum, 100-year storm flows.

Policy PS-7.2: Require that new developments minimize stormwater and urban runoff into drainage facilities by incorporating design features such as detention basins, on-site water features, or other strategies.

Policy PS-7.3: Maintain an active storm drain inspection program.

Policy PS-7.4: Protect critical facilities located within areas subject to flooding

Policy PS-7.5: Evaluate and monitor water storage facilities to determine which facilities are not self-contained and might pose an inundation hazard to downstream properties.

Policy PS-7.6: Employ strategies and design features that will reduce the amount of impervious surfaces (i.e., paved area) for new development projects.

Policy PS-7.7: Incorporate adequate measures into proposed development projects to achieve an acceptable level of risk from potential flooding hazards. Mitigation measures should address projected impacts from climate change.

Policy PS-7.8: Whenever feasible, locate essential public facilities, including health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities, outside flood hazard zones.

**Implementation
Guide**



See Section XXI of the Implementation Guide for action programs.

GEOLOGIC AND SEISMIC CONSIDERATIONS

The complex topography and geology of the Puente and Chino Hills create wonderful visual features that form a strong backdrop to Brea. These features are evidence of conditions that pose potential constraints to development. Brea lies within one of the most potentially seismically active areas of Southern California, adjacent to the Whittier fault and atop the Elysian Park Thrust fault. Both of these fault zones have the potential to generate moderate to large earthquakes that could cause substantial property damage and possibly loss of life. Most properties within the city, Carbon Canyon, and surrounding area are characterized by steep rugged hillside terrain subject to landslides and soil erosion. Areas adjacent to stream beds and drainage channels tend to exhibit liquefaction conditions and ground instability.



Ground shaking associated with earthquakes can cause slope failures.

Context

Seismic Hazards

Two major faults traverse the planning area, the Whittier fault and Elysian Park Thrust fault. The Whittier fault cuts across the hills and through the eastern half of the City in a northwesterly direction (Figure 13). Several traces are considered active. The Elysian Park Thrust fault, a buried fault approximately 6 to 10 miles below the ground surface is more threatening, with a greater potential to cause a large magnitude earthquake. In hillside areas an earthquake may also trigger landslides. In flat

valley areas, the deep, alluvial soils can increase the amplitude and duration of ground shaking.

Earthquake Magnitude and Intensity

Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source or epicenter of the earthquake with the use of a seismograph. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. Table 1 gives intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Preparing for earthquakes requires preparing for the worst-case scenario earthquake. Engineers construct dams and bridges to withstand the maximum credible earthquake (MCE) to prevent structure failure. The MCE is defined as the largest possible earthquake that could reasonably occur along the recognized faults or within a particular seismic source, and by definition

has a very low probability of occurrence. City officials can prepare against the worst-case scenario earthquake by understanding the potential effects of an MCE. Table 1 lists magnitude and intensity of the MCE for faults that could potentially impact Brea.

Table 1
Magnitude and Intensity of Maximum Credible Earthquake for Faults Potentially Impacting Brea

Fault Name	Distance to Brea (miles)	Magnitude of MCE	Intensity from MCE
Elysian Park Thrust	0	6.7	X
Whittier	Less than a mile	7.3	X
San Andreas	33	7.8	VII

Source: Earth Consultants International, 2002.

Computer models can estimate the effects of earthquakes with the potential magnitudes described in the above table. An earthquake on either the Elysian Park Thrust or Whittier fault could damage residential buildings, particularly those constructed with wood or reinforced masonry, as well as mobile homes.

Computer analyses conducted for Brea estimated more than 12,000 buildings could be damaged during an earthquake on the Elysian Park Thrust fault, and more than 15,000 buildings could be at least moderately damaged during an earthquake on the Whittier fault. Soft-story buildings do not typically perform well in earthquakes. These buildings are typically characterized by a first story lacking adequate strength or toughness. The soft-story is prevalent in the older historic neighborhood along South Brea Boulevard.

An MCE earthquake on the Whittier fault could potentially create an economic loss of \$1.04 billion (equivalent to 27 percent of the total replacement value of the City's buildings). An Elysian Park Thrust fault MCE earthquake could potentially create an economic loss of \$518 million (equivalent to 13 percent of the total replacement value of the City's buildings). Even an MCE earthquake on the San Andreas fault, located approximately 30 miles away, could be potentially devastating, destroying approximately 8,000 buildings and potentially causing an economic loss over \$300 million. Table 2 on the next page outlines the impacts of the various magnitudes and intensities of earthquakes.

Alquist-Priolo Earthquake Fault Zoning Act

The State of California, per the requirements of the Alquist-Priolo Earthquake Fault Zoning Act, requires the delineation of earthquake fault zones along faults that are sufficiently active and well-defined. The Act requires cities and counties to withhold development permits for sites within an earthquake fault zone until geologic investigations demonstrate that the sites are not threatened by surface displacements from future faulting. In Brea, the Whittier fault meets this definition, and the fault zone boundaries shown in Figure 13 reflect State-delineated boundaries.

Table 2
Magnitude and Intensity Scales of Earthquakes

Magnitude	Descriptor	Intensity	Description
1.0 - 3.0	Very Minor	I	I. Not felt except by a very few under especially favorable conditions.
3.0 - 3.9	Minor	II - III	II. Felt only by a few persons at rest, especially on upper floors of buildings. III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0 - 4.9	Light	IV - V	IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 - 5.9	Moderate	VI - VII	VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 - 6.9	Strong	VIII - IX	VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0 -7.9 8.0 and higher	Major Great	X - XII	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: United States Geological Survey (USGS) National Earthquake Information Center, (<http://neic.usgs.gov>), April 2001.

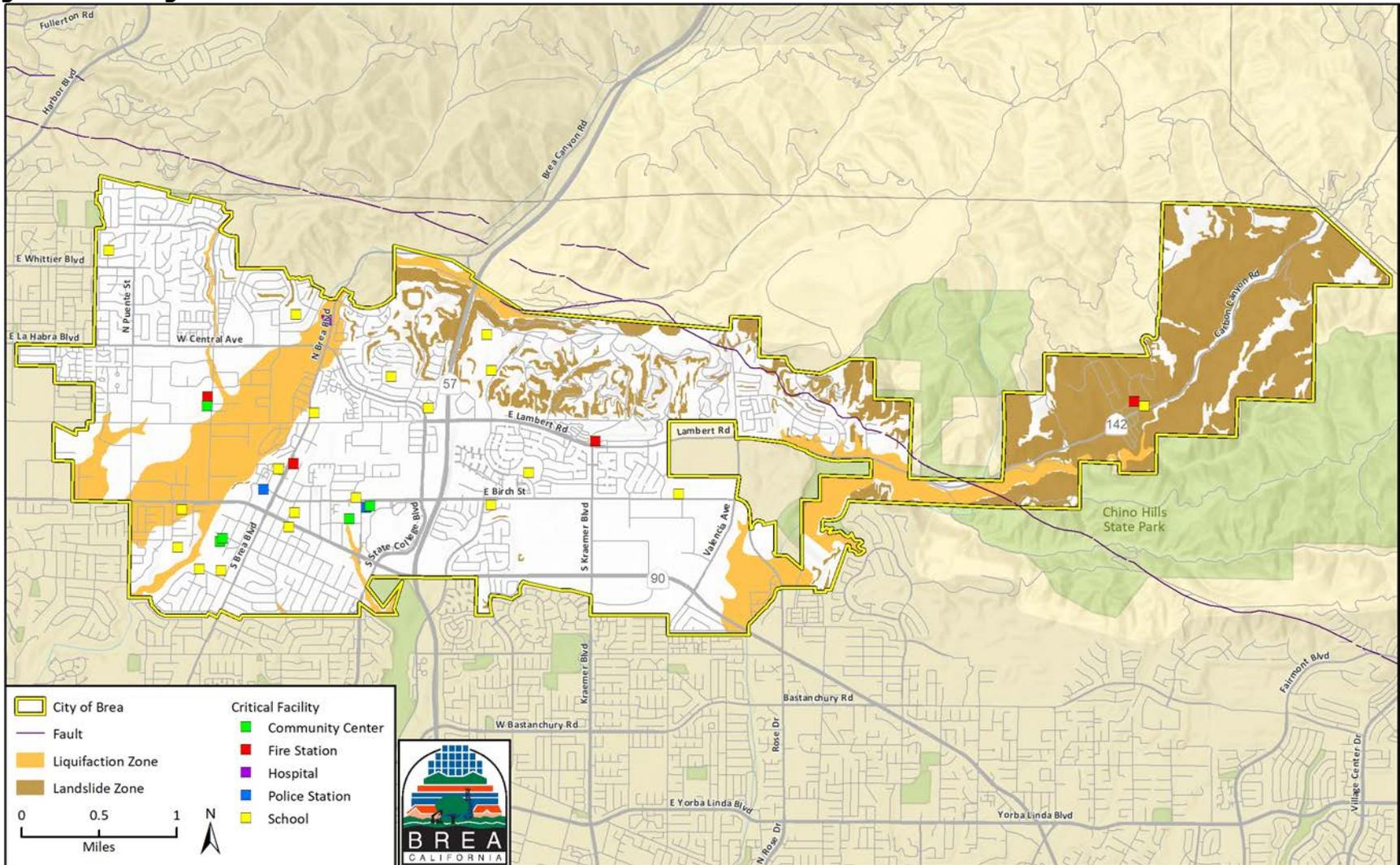
Imagine Brea

Liquefaction, Landslides, and Soil Erosion

Geologic hazards associated with ground shaking include liquefaction and ground failure. Liquefaction is a phenomenon in which the stiffness of a soil is reduced when ground shaking causes water-saturated soil to become fluid and lose its strength. Liquefaction and related phenomena have been responsible for tremendous amounts of damage, creating problems with bridges, buildings, buried pipes, and tanks. Liquefaction hazards are significant along stream channels due to the porous nature and high water content of the soil. These areas include Tonner Canyon Creek, Brea Canyon, and areas around the Carbon Canyon Dam (Figure 13).

Steep topography, fractured and unconsolidated bedrock conditions, expansive soils, and high erosion potential make many hillside areas highly unstable. Landslides are typical on moderate to steep slopes. Historically, Brea's hillsides have experienced many failures, as illustrated in Figure 13 below, and the potential for future landslides is high. Landsliding may result from heavy rain, erosion, removal of vegetation, and seismic activity. While failed slope materials can be removed and slopes stabilized to allow development, great care must be taken to identify all potential geologic hazards wherever development is proposed.

Figure 13. Geologic and Seismic Hazards



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Source: California Geological Survey, 2020.

Goals and Policies

In Brea, hillside development is tricky, given the constraints posed by local geology. Land use policies set forth in the Community Development chapter identify the City’s approach to allowing development in areas with challenging terrain and geologic conditions, policies that balance the need to protect life and property with the goal of providing new housing opportunities. In all cases, development can only occur where living conditions can be made safe.

The combination of sound planning practices and continued education of residents will minimize risks to the community from seismic and geologic hazards, and will protect the health, safety, and welfare of Brea residents.

Goal PS-1	Reduce the risk to the community from seismic activity and geologic conditions, including ground shaking, fault rupture, liquefaction, and landslides.
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Policy PS-8.1 Minimize the potential damage to structures and loss of life that may result from an earthquake.

Policy PS-8.2 Require seismic safety standards for construction of all new buildings.

Policy PS-8.3 Continue to require geological and geotechnical investigations of all new developments in areas of potential seismic or geologic hazards as part of the environmental and development review process.

Policy PS-8.4 Require that careful, site-specific evaluations based on detailed surface and subsurface geotechnical studies be conducted in areas where landslides are suspected or known to occur. Consider projected climate change impacts of wildfire and increased frequency and intensity of storms and develop mitigation strategies for new areas deemed at risk to landslides.

Policy PS-8.5 Participate in Federal, State, and local earthquake preparedness and emergency response programs.

Policy PS-8.6 Continue programs, such as the Community Assistance and Response to Emergency Situations (C.A.R.E.S), that further educate and train individuals and neighborhoods how to respond to emergency situations.

Policy PS-8.7 Ensure that water supplies are not interrupted by seismic events such as surface rupture, ground shaking, ground failure, or dam failure.

**Implementation
Guide**



See Section XXII of the Implementation Guide for action programs.

NOISE

Studies have identified noise as an environmental pollutant that can have substantial and permanent impacts on human health and general well-being. Not only is noise a health hazard, but excessive noise can also be a source of annoyance, tension, and discomfort that disrupts everyday activities. Brea aims to substantially reduce noise and its impacts within the urban environment, with a focus on protecting residential neighborhoods, schools, and similar sensitive uses.

Context

In Brea, street and freeway traffic represent the primary noise sources. Industrial and commercial activity present concerns where adjacent to residential neighborhoods. In addition, mechanical equipment, playgrounds, leaf blowers, and construction equipment are examples of random noise sources that can contribute to neighborhood noise.

Figure 15 displays a composite picture of average noise levels in Brea in 2001. As Figure 15 illustrates, the loudest noise levels occur along State Highway 57, Imperial Highway, Brea Boulevard, and Valencia Avenue, where truck traffic associated with the Olinda Alpha landfill lingers past homes and places of business. Lambert Road also experiences loud noise levels due to access to State Highway 57.

Noise and Land Use Compatibility Guidelines

Noise generally is defined as unwanted or intrusive sound. Because noise consists of pitch, loudness, and duration, describing noise with a single unit of measure presents a challenge. The A-weighted decibel scale, or dB(A), has been developed to describe the loudness of a sound or sound environment based on the sensitivity of the human ear. A sound level meter that measures A-weighted decibels has an electrical circuit that allows the meter to have the same sensitivity to sound at different frequencies as the average human ear. Table 3 indicates criteria the State has established to reduce adverse noise effects on human health.

Table 3
State Criteria for Minimizing
Adverse Noise Effects on Humans

Objective	dB(A) Range
Prevent Hearing Loss	75-80
Prevent Physiological Effects (Other than hearing loss)	65-75
Prevent Speech Interference	50-60
Address People's Subjective Preference for Noise Control	45-50
Prevent Sleep Interruption	35-45

Source: California General Plan Guidelines, 2000.

The dB(A) descriptor only reports noise from a single source or combination of sources at a point in time. To allow a more comprehensive description of a noise environment, federal and State agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. Two measurement scales commonly used in California are the Community Noise Equivalent Level (CNEL) and the day-night level (Ldn). To account for increased human sensitivity at night, the CNEL level includes a 5-decibel penalty on noise during the 7:00 A.M. to 10:00 P.M. time period and a 10-decibel penalty on noise during the 10:00 P.M. to 7:00 A.M. time period. The Ldn level includes only the 10-decibel weighting for late-night noise. These values are nearly identical for all but unusual noise sources.

The City will use land use compatibility standards when planning and making development decisions in order to ensure that noise producers do not adversely affect sensitive receptors.

The City's primary goal with regard to community noise is to minimize the exposure of residents to unhealthful or excessive noise levels to the extent possible. To this end, the noise/land use compatibility guidelines in Figure 14, based on cumulative noise criteria for outdoor noise, are used to review development proposals and to identify and mitigation measures necessary to avoid or minimize impacts, including traffic noise impacts, a new use may have on established uses.

Noise Contours and Noise Impact Areas

The use of noise contours based on the major noise sources can describe the noise environment for the community. Noise contours outline areas of equal noise exposure. Future noise contours have been estimated using information about existing and projected land use development and transportation activity.

The projected noise contours and noise impact areas for Brea are displayed in Figure 16. These contours will serve as a guide for land use and development decisions. Contours of 60 dB(A) or greater define noise impact areas. An acoustical analysis must be prepared when noise sensitive land uses are proposed within noise impact areas. The analysis must show that the project is designed to attenuate noise to meet the City's noise standards in order to receive approval. If the project design does not meet the noise standards, mitigation can be recommended in the analysis. If the analysis demonstrates that the noise standards can be met by implementing the mitigation measures, the project can be approved conditioned upon implementation of the mitigation measures.

Transportation Related Noise

Transportation activity is the primary source of noise in Brea. The three major sources of transportation related noise are:

- Traffic on the Orange Freeway (SR-57)
- Commercial truck traffic associated with the Olinda Alpha landfill on Valencia Avenue and Imperial Highway
- Automobile traffic on Brea Boulevard, Brea Canyon Road, Central Avenue, and Lambert Road

Residential neighborhoods bordering the Orange Freeway are subject to loud noise levels. Properties directly adjacent to the freeway can experience decibels as high as 70 to 75 dB(A). Sound attenuation walls, landscaped buffers, and dirt mounds all help to reduce the sound intensity of the freeway. Figure 16 illustrates the projected noise contours along the freeway.

Commercial trucks associated with the Olinda Alpha landfill contribute to excessive noise levels via the Orange Freeway,

Imperial Highway, and Valencia Avenue to connect with the landfill. Commercial trucks are not permitted to access Valencia Avenue via Lambert Road, minimizing some of the noise impacts to adjacent residential neighborhoods. Olinda Alpha is

slated to close in the year 2013; however, the County of Orange is investigating extending the life of the landfill much further.

New residential development has been recently constructed at the northeast corner of Valencia Avenue and Carbon Canyon Road just south of the Olinda Alpha landfill entrance. Dense planting of deciduous and evergreen trees as well as a sound attenuation wall were set within the landscaped area to minimize the impacts to residential properties directly abutting Valencia Avenue.

Proposed residential land uses have also been designated for both sides of Valencia Avenue south of Lambert Road/Carbon Canyon Road. Residential, school, and park uses are proposed for the Hartley Research Center. Careful planning and mitigation within these areas will protect these sensitive uses from excessive noise levels.

Noise levels along Brea Boulevard, Brea Canyon Road, Central Avenue, and Lambert Road are above average and can impact sensitive uses adjacent to these streets.

Traffic noise depends primarily on the speed of traffic and the percentage of truck traffic. The primary source of noise from automobiles is high-frequency tire noise, which increases with speed. In addition, trucks and older automobiles produce engine and exhaust noise.

The most efficient and effective means of controlling noise from transportation systems is to reduce noise at the source. However, the City has little direct control over noise produced by transportation sources because State noise regulations preempt local regulations. Because the City cannot control noise at the source, City noise programs focus on reducing the impact of transportation noise at reception sites. During the planning stages of the development process, potential impacts from transportation noise will be identified and mitigation measures will be required as needed to meet City noise standards.



Sound attenuation walls and limits on speed help to shield residential neighborhoods from automobile noise on Imperial Highway.

Non-Transportation Related Noise

When reviewing a proposed industrial, commercial, or public project, noise generation and potential impacts to surrounding development are considered in accordance with CEQA. Specific attention should be given to non-residential proposals adjacent to residential neighborhoods. An acoustical analysis is required for projects that will generate noise potentially affecting sensitive receptors. Where significant impacts are identified, mitigation measures are required. Common mitigation measures that could be applied when reviewing projects include acoustically treated and quiet design: 1) furnaces, 2) fans, 3) motors, 4) compressors, and 5) valves and pumps. The City may also require limited delivery hours and hours of operation to minimize impacts on adjacent residential users or other sensitive receptors.

Figure 14. Noise/Land Use Compatibility

Land Use Category	Community Noise Equivalent Level (CNEL) or Day-Night Level (Ldn), dB						
	55	60	65	70	75	80	85
Residential- Low-Density Single-Family, Duplex, Mobile Homes	•	•	•	•	•	•	•
Residential- Multiple Family	•	•	•	•	•	•	•
Transient Lodging - Motels, Hotels	•	•	•	•	•	•	•
Schools, Libraries, Churches, Hospitals, Nursing Homes	•	•	•	•	•	•	•
Auditoriums, Concert Halls, Amphitheatres	•	•	•	•	•	•	•
Sports Arenas, Outdoor Spectator Sports	•	•	•	•	•	•	•
Playgrounds, Neighborhood Parks	•	•	•	•	•	•	•
Golf Courses, Riding Stables, Water Recreation, Cemeteries	•	•	•	•	•	•	•
Office Buildings, Business, Commercial and Professional	•	•	•	•	•	•	•
Industrial, Manufacturing, Utilities, Agriculture	•	•	•	•	•	•	•

Nature of the noise environment where the CNEL or Ldn level is:

Below 55 dB
Relatively quiet suburban urban areas, no arterial streets within 1 block, no freeways within 1/4 mile.

55-65 dB
Most somewhat noisy urban areas, near but not directly adjacent to high volumes of traffic.

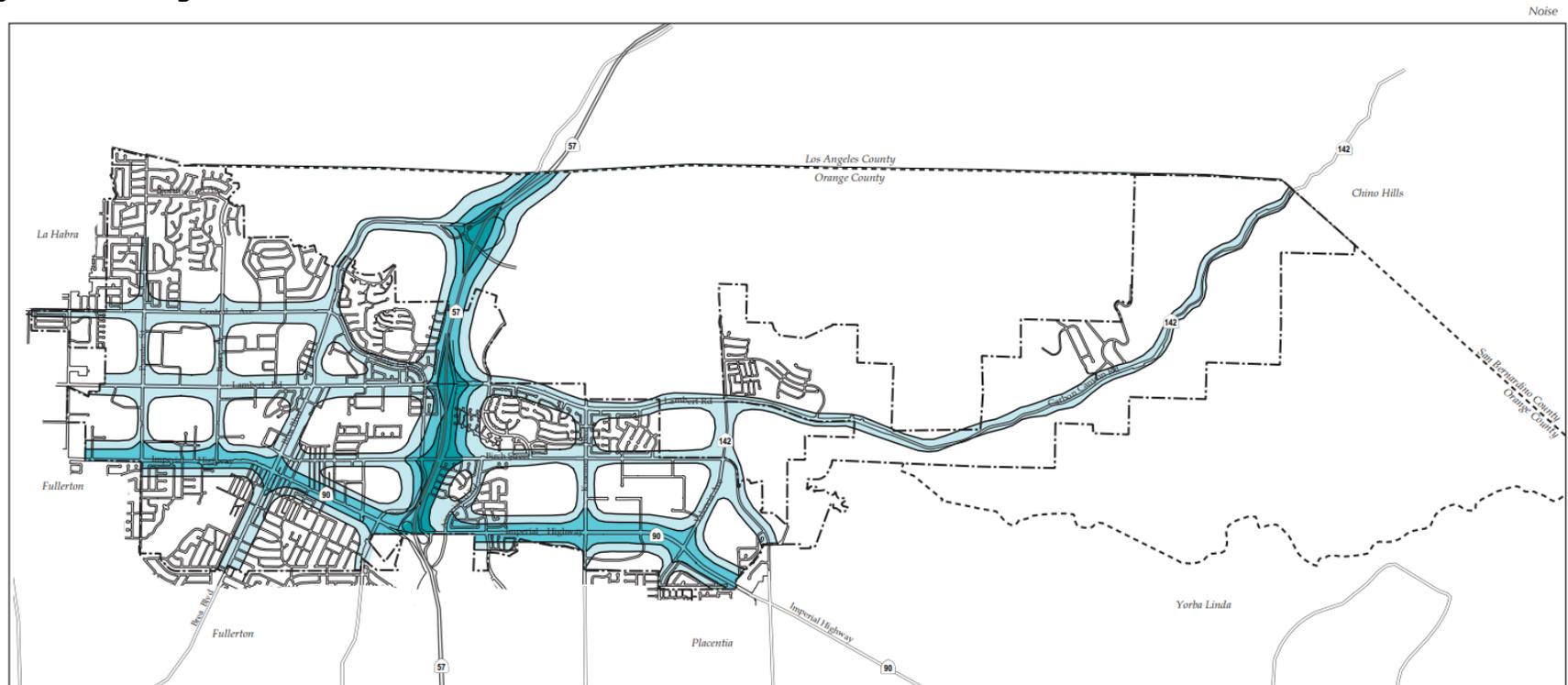
65-75 dB
Very noisy urban areas near arterials, freeways or airports.

75+ dB
Extremely noisy urban areas adjacent to freeways or under airport traffic patterns. Hearing damage with constant exposure outdoors.

 Normally Acceptable Specified land use is satisfactory, based on the assumption that any buildings are of normal conventional construction, without any special noise insulation requirements	 Conditionally Acceptable New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.	 Normally Unacceptable New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in design.	 Clearly Unacceptable New construction or development should generally not be undertaken.
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The Community Noise Equivalent Level (CNEL) and Day-Night Noise Level (Ldn) are measures of noise environment. They represent the constant A-weighted noise level that would be measured if energy received over the day were averaged. In order to account for the greater sensitivity of people at night, the CNEL weighting includes a 5-decibel penalty on noise between 7:00 p.m. and 10:00 p.m. and a 10-decibel penalty on noise between 10:00 p.m. and 7:00 a.m. of the next day. The Ldn includes a 10-decibel weighting for late-night noise events. For practical purposes, the two measures are equivalent for typical urban noise environments.

Figure 15. Average Noise Levels in Brea (2001)



Source: Weiland Associates, 2001.

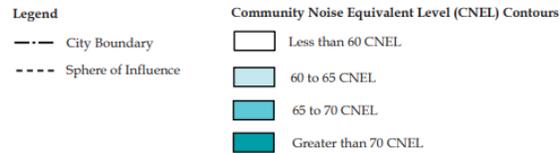
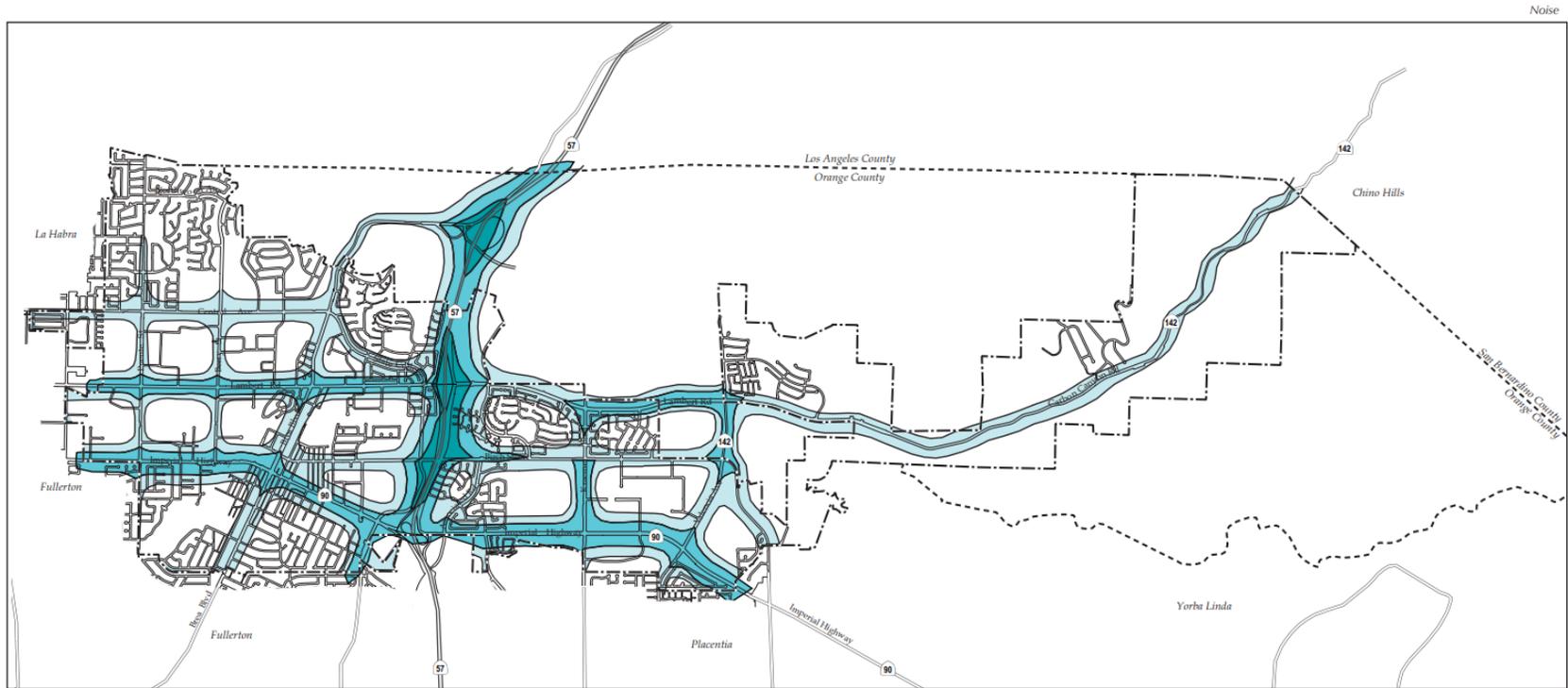


Figure 16. Future Noise Contours



Source: Weiland Associates, 2001.



Legend

- City Boundary
- Sphere of Influence

Community Noise Equivalent Level (CNEI) Contours

- Less than 60 CNEI
- 60 to 65 CNEI
- 65 to 70 CNEI
- Greater than 70 CNEI



Goals and Policies

Certain areas of Brea are subject to high levels of noise. This in turn can reduce the quality of life within these neighborhoods. Consideration of noise sources in the planning process and identification of who that noise impacts is an effective method of minimizing the impacts of noise on residents. Areas already impacted by noise can explore different noise attenuation and rehabilitative improvements.

Goal PS-9	Minimize the impact of point source noise and ambient noise levels throughout the community.
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Policy PS-9.1 Evaluate the need to require acoustical studies for development proposals that address both direct and indirect, particularly traffic, noise impacts, and require such studies, with appropriate mitigation included, as warranted.

Policy PS-9.2 Ensure that the noise standards set forth in the Municipal Code reflect standards most appropriate for Brea.

Policy PS-9.3 Ensure that acceptable noise levels are maintained near schools, hospitals, convalescent homes, and other noise sensitive areas in accordance with the City's Municipal Code and noise standards contained in the General Plan.

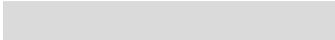
Policy PS-9.4 Employ creative methods of reducing noise pollution in the City.

Policy PS-9.5 Avoid placing high-noise activity centers near residential areas.

Goal PS-10	Minimize the impacts of transportation-related noise.
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Policy PS-10.1 Reduce transportation noise by imposing traffic restrictions where necessary.

Policy PS-10.2 Work with the counties of Orange and Los Angeles to include noise mitigation measures in the design of new roadway projects.



Goal PS-11 Minimize noise impacts from sources other than transportation.

- Policy PS-11.1 Require the inclusion of noise mitigation measures, techniques, and design features in the planning, design, and construction of future development and redevelopment projects.
- Policy PS-11.2 Require that mixed-use structures be designed to prevent transfer of noise and vibration from commercial/retail to residential use.
- Policy PS-11.3 Minimize stationary noise sources and noise emanating from construction activities and special events.
- Policy PS-11.4 Require that new non-residential development plan delivery areas away from existing residential areas.
- Policy PS-11.5 Continue active enforcement to limit commercial and industrial delivery hours adjoining residential areas.

Implementation Guide



See Section XXIII of the Implementation Guide for action programs.

Imagine Brea

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