



PUBLIC SAFETY

INTRODUCTION AND VISION FOR THE FUTURE

Maintaining a safe living environment is one of the most important challenges cities face. Orange prides itself on being a safe community with high quality emergency services and a high level of emergency preparedness. The Public Safety Element offers possible solutions for proactively addressing threats including natural and human-caused hazards, crime, and homeland security. Future land use decisions must be considered in the context of natural hazards, such as wildfires, earthquakes and floods. These decisions must also consider provision of public services, such as police, fire, and emergency medical services.

Orange's *Vision for the Future*, presented in the General Plan Introduction, introduces a variety of objectives describing the desired quality of life of Orange residents in the future, including the following:

- Orange recognizes the importance of managing development in a manner that ensures adequate and timely public services and infrastructure and limits impacts on the natural environment.
- The City will work to improve the quality of life for all residents by providing residential, commercial, industrial, and public uses that exist in harmony with the surrounding urban and natural environments.

Sustaining and continuing to improve community safety is one of the City's most important challenges. By implementing the Public Safety Element, the City will provide timely emergency service delivery and focus on expanding such services throughout the community. Through implementation of these policies, the City can also continue to prepare residents and businesses for disasters and plan for development of a safer community while likely increases in traffic congestion, extreme weather pattern variations, population growth, and ever-changing needs within the community continue to stretch the use of limited resources.

Purpose of the Public Safety Element

The State General Plan Guidelines direct cities to incorporate a number of required elements into their general plans, including Safety. Orange's Public Safety Element addresses such issues as geologic and seismic activity, flood hazards, fire, hazardous materials, and aircraft operations. Other public safety issues include interjurisdictional cooperation, homeland security, urban design as a crime prevention tool, and issues related to Orange's hillsides and waterways.



Scope and Content of the Public Safety Element

The Public Safety Element is comprised of three sections:

- (1) Introduction;
- (2) Issues, Goals, and Policies; and
- (3) Public Safety Plan.

The *Introduction* defines the purpose, scope, and content of the Public Safety element, and its relationship to other General Plan Elements. The *Issues, Goals, and Policies* section describes the community's desire to address the most relevant public safety issues affecting the City. The *Public Safety Plan* provides hazard maps, and establishes standards and requirements to achieve goals and implement policies. Detailed implementation programs for the Public Safety Element are listed in an Appendix to the General Plan.

Public Safety Considerations

State law requires that the General Plan address the following public safety concerns.

Natural Environmental Hazards

- Earthquakes and their related effects (surface rupture, liquefaction, ground shaking)
- Landslides, mudslides, rock falls, and soil creep
- Flooding due to excessive storm runoff or dam failure
- Wildland fires

Human-Caused Hazards Affecting Land Use Policy

- Hazardous materials
- Urban and Wildland fires
- Crime
- Homeland Security

Relationship to Other General Plan Elements

Accomplishing the goals and policies of the Public Safety Element requires coordination with other related components of the City's General Plan. Other topics that are affected by the Public Safety Element include the Land Use, Circulation & Mobility, Infrastructure, Urban Design, Housing, and Natural Resources Elements. Also affected and coordinated within the Public Safety Element is Environmental Justice for disadvantaged communities.

Impacts of Public Safety policies and programs on the Land Use Element arise during identification of areas prone to natural hazards. For example, proposed land uses must comply with the land use compatibility standards contained in this element. Recommendations for evacuation and emergency access routes in the Public Safety Element affect the Circulation & Mobility Element. In turn, traffic calming goals and policies within the Circulation & Mobility Element have implications for emergency response. The Infrastructure Element addresses the maintenance of lifeline utility infrastructures, such as flood control facilities, that ensure



protection from natural disasters. Streetscape improvements recommended in the Urban Design Element, including the addition of landscaped medians at some locations, may also affect emergency response, but could reduce the number of accidents along certain arterials. The Public Safety Element provides policies to support housing and neighborhood safety, which contribute to the success of policies in the Housing Element to provide adequate housing. The Natural Resources Element is also linked to Public Safety, because open space zones and allowable uses are often affected by the location of the boundaries of hazard prone zones. For example, areas prone to liquefaction hazards are often coincident with riparian streams and surrounding areas preserved as open space.

Inclusion of the City of Orange Local Hazard Mitigation Plan

The City of Orange Local Hazard Mitigation Plan (LHMP), first adopted by the City Council on June 13, 2017, is adopted as part of the Public Safety Element. The LHMP establishes the City’s risk-based approach to reducing loss of life and property by lessening the impact of disasters. The LHMP includes a comprehensive, long-term mitigation plan that identifies risks and vulnerabilities associated with natural disasters and facilitates City engagement in hazard mitigation planning. The LHMP includes sections on the purpose of the document, the profile of Orange, a hazard assessment, mitigation actions, and plan maintenance, implementation, and monitoring.

The Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) for the City of Orange planning area was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA’s Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard risk. The implementation of these mitigation actions, which include both short and long-term strategies, involve planning, policy changes, programs, projects, and other activities. The LHMP can be found on the City’s website at: <https://www.cityoforange.org/home/showpublisheddocument/5603>.

ISSUES, GOALS AND POLICIES

The goals, policies, and implementation programs of the Public Safety Element address nine issues identified as important to the City: (1) protecting citizens from seismic hazards and other geologic constraints; (2) protecting the City from flood-related risks and hazards; (3) protecting the lives and property of Orange residents and businesses from urban and wildland fire hazards; (4) minimizing risks to life, property, and the environment associated with producing, using, storing, or transporting hazardous materials; (5) reducing safety hazards associated with civilian, military, and medical air traffic; (6) providing public safety services of the highest quality; (7) improving community safety and reducing opportunities for criminal activity; (8) emphasizing emergency preparedness throughout both the City organization and the community; and (9) providing safe pedestrian and bicycle environments. These nine issues include provisions for Environmental Justice to disadvantaged communities.



Geologic and Seismic Hazards

The most significant environmental hazards that may affect land use in Orange are seismic and geologic hazards. Earthquakes and their related effects have the greatest potential to affect a large portion of the population. Other geologic hazards such as landslides and ground subsidence could have more localized effects. The combination of sound planning practices and continued public education will minimize risks to the community from seismic and geologic hazards, and will protect the health, safety, and welfare of Orange residents.

GOAL 1.0: Protect residents and businesses from seismic hazards and other geologic constraints.

Policy 1.1: Minimize the potential loss of life and damage to structures that may result from an earthquake.

Policy 1.2: Educate and train individuals and neighborhoods how to respond to emergency situations.

Policy 1.3: Participate in federal, State, and local earthquake preparedness and emergency response programs.

Flood Hazards

Portions of Orange are susceptible to flood events from either a major storm or a dam failure resulting from a significant earthquake. Dams are present along Santiago Creek at two locations: Villa Park Dam and Santiago Dam (Irvine Lake). Both are located in the foothills of east Orange. Peters Canyon Dam is located within Peters Canyon about two miles west of Irvine Lake. Unlike Santiago Creek, which flows generally northwest, Peters Canyon drains to the south in this area. Prado Dam is located approximately seven miles northeast of the eastern portions of the planning area in Corona. Areas below (downstream from) these dams, including large areas within the City of Orange, have high potential for inundation in the unlikely event of catastrophic dam failure (maps showing dam inundation areas are available for public review at the Community Development Department). These dams and their reservoirs prevent periodic flooding that would be expected to occur in a natural setting. Recognizing and preparing for floods allows the community to avoid associated dangers.

GOAL 2.0: Protect the City from flood-related risks and hazards.

Policy 2.1: Cooperate and work with the Orange County Flood Control District to ensure District flood control facilities are well maintained and capable of providing flood protection levels for 100-year storm flows.

Policy 2.2: Protect critical public and private facilities located within areas subject to flooding and dam inundation.

Policy 2.3: Evaluate and monitor water storage facilities to determine which facilities might pose an inundation hazard to downstream properties.

Policy 2.4: Employ strategies and design features that will reduce the amount of impervious surface (i.e. paved area) within new development projects.



- Policy 2.5: Provide a safety assessment for post-fire events with a plan to minimize flooding, protect water quality, limit sediment flows, and reduce risks to adjacent properties, particularly in areas prone to landslides. Restore wildfire areas by planting native vegetation cover, encouraging the re-growth of native species, or using best practices as soon as possible in advance of the rainy season to aid in control of storm water runoff and facilitate slope stabilization.

Fire Hazards

Fire and its destructive potential are safety concerns within both the urban areas of the City and the undeveloped hillsides. Wildland fires are most problematic along the developed residential fringes of the hillsides, known as the wildland-urban interface. On a seasonal basis, dry vegetation, little seasonal rain, and Santa Ana wind conditions combine with extreme weather pattern variations to increase wildfire potential. New development, particularly in the eastern portion of Orange, will result in increased fire hazards due to higher levels of interface between residential development and open grassland and vegetation along hillsides. Keeping neighborhoods buffered from both urban and wildland fire hazards reduces incidents requiring response, and minimizes damage to property when fires do occur. In addition, urban fire hazards are a continuing concern in the City's industrial areas.

GOAL 3.0: Protect lives and property of Orange residents and businesses from urban and wildland fire hazards.

Policy 3.1: Continue to identify and evaluate new potential fire hazards and fire hazard areas.

Policy 3.2: Consider non-traditional methods of controlling vegetation in undeveloped areas.

Policy 3.3: Require defensible space maintenance agreements for new development projects and require extension of defensible space maintenance agreements to subsequent landowners. Landowners shall maintain minimum defensible space from all structures or improvements on their property and work with neighbors and the City to address defensible space within distances deemed necessary by Fire Prevention staff from structures existing on adjacent property. Planting and maintenance of fire-resistant slope cover shall improve defensible space and reduce the risk of brush fires within the wildland-urban interface areas located in the northern and eastern portions of the City and in areas adjacent to canyons, and the City shall refine and development shall implement structural hardening measures through stringent site design and maintenance standards for all areas with high wild land fire potential. To the extent possible native, non-invasive plant materials shall be used to reduce the potential for conflicts between safety and environmental goals. Fuel modification plans shall be prepared for new development projects to describe and address allowable plant materials and hardscape measures and design; defensible space distances and maintenance; and how fuel and vegetation around homes and roadways will be maintained and cleared.

Policy 3.4: Educate the public regarding fire safety through public outreach, and support for localized efforts to become a Firewise Community. Public outreach efforts



shall also include discussions relating to benefits and purpose of defensible space and maintenance, and evacuation and emergency vehicle access routes and programs.

- Policy 3.5: Continue to utilize the City’s Emergency Operation Plan (EOP) including existing Wildland Urban Interface pre-plans which among other components do the following:
- Identify low risk fire safety areas, including locations that may serve as temporary shelter during wildfire events.
 - Identify fire defense zones where firefighters can control wildfire without undue risk to their lives.
 - Designate and publicize areas where firefighter safety prohibits ground attack firefighting.
 - Identify fuel breaks and other fire defense improvements on both public and private property.
 - Provide for adequate fire suppression resources in the local responsibility area, and coordinate with CAL FIRE regarding State responsibility area and scenarios where wildfires affect both areas.
- Policy 3.6: Periodically review trends and projections of future fire risk, including forecasted exasperated risk from climate change and drought, and fire risk reduction capabilities to ensure that mitigation measures are adequate.
- Policy 3.7 Continue to implement fire prevention strategies and fire safe development codes.
- Policy 3.8 Consistent with the Infrastructure Element, identify engineering vulnerabilities in lifeline utilities, such as overhead power lines, for exposure to or threats of wildland fire.
- Policy 3.9 Obtain compliance with State Regulations, Building and Fire Codes, and City Guidelines for non-conforming properties particularly to increase resilience of existing development in high-risk areas built prior to modern fire safety codes or wildfire hazard mitigation guidance. Ensure all infill development projects within the SRA or VHFHSZ comply with all applicable State and City fire safety and defensible space regulations or standards which include using best practices for fire-resistant or fireproof construction methods, materials and landscaping to reduce susceptibility to wildfire.
- Policy 3.10 Recognize the overlap between the Natural Community Conservation Plan and the Very High Fire Hazard Severity Zone, to achieve species and habitat protection, resource protection, water quality, carbon sequestration and storage, and wildfire hazard and risk mitigation.
- Policy 3.11 Ensure public and private landowners for all existing land uses comply with all applicable State and local requirements and implement site-specific safety measures that mitigate wildfire risk down to a low category designation by preventing threats to the interface of public facilities, infrastructure, natural resources, and the urban environment.



- Policy 3.12 Prioritize infill development within the existing developed footprint to avoid future unfunded emergency vehicle access infrastructure creating repair and maintenance liabilities; and to reduce potential wildfire hazards originating from development adjacent to environmentally sensitive open space areas.
- Policy 3.13 Avoid expanding new development, critical facilities, and infrastructure in areas subject to extreme threat or high risk, such as High or Very High FHSZs or areas classified by CAL FIRE as having an Extreme Threat classification on Fire Threat maps, unless all feasible risk reduction measures have been incorporated into project designs or conditions of approval. Ensure subdivisions and developments exist in concert with the natural ecosystem.
- Policy 3.14 Prohibit land uses that could place occupants at unreasonable risk in high or very high fire hazard severity zones, such as areas with large events or assembly of people, health care facilities, or similar uses.
- Policy 3.15 Monitor plant communities in wildland areas over time for changes in potential fire hazard severity or risks.
- Policy 3.16 Plan, design, and manage urban open space facilities to reduce wildfire hazards and associated risks and to demonstrate fire-adapted landscaping.
- Policy 3.17 Ensure all residences located in State responsibility or local responsibility areas comply with the fuel modification requirements of Public Resource Code Section 4291.
- Policy 3-18 Provide fire safety inspections to newly owned, operated, leased, controlled, or maintained buildings located in the high fire hazard severity zone (HFHSZ) or very high fire hazard severity zone (VHFHSZ) in accordance with AB 38. The seller of the properties within these zones must present documentation to the buyer that the property is in compliance with wildfire protection measures as dictated by the local vegetation management ordinance.
- Policy 3-19 All new development and redevelopment in the VHFHSZ shall prepare fire protection plans that confirm compliance with the most current version of the California Building Codes and California Fire Code as adopted by the City. The fire protection plans shall also address long-term maintenance of fire hazard reduction projects and activities such as community fire breaks and private and public road vegetation clearances; delineate safe ingress and egress access areas and routes; describe evacuation and emergency vehicle access routes; ensure that home and street addressing shall be visible to emergency vehicles; and provide appropriate signage that shows access areas and routes for evacuation and emergency vehicles. The City shall maintain vegetation clearances along public roads. Private roads shall be maintained by the appropriate private homeowner's association or easement holder with abatement inspections conducted at least annually by Fire Department staff.
- Policy 3-20 All new development and redevelopment in the VHFHSZ shall comply with the requirements found in Title 14 of the California Code of Regulations (Natural Resources), Division 1.5 (Department of Forestry and Fire Protection), Chapter 7 (Fire Protection), Subchapter 2 (SRA Fire Safe Regulations), Article 1 (Administration), Article 2 (Emergency Access and Egress), Article 3 (Signing



and Building Numbers), Article 4 (Emergency Water Standards), and Article 5 (Fuel Modification Standards); and Subchapter 3 (Fire Hazard), Article 3 (Fire Hazard Reduction Around Buildings and Structures).

- Policy 3-21 All new development and redevelopment in the VHFHSZ shall be inspected for compliance with the fire hazards policies and requirements of this Public Safety Element after large fires have occurred within the VHFHSZ.
- Policy 3-22 Continue to monitor and forecast future water supply and fire flow availability and assess and ensure future fire suppression needs are satisfied.
- Policy 3-23 Should new water supplies be required, the new water facilities and improvements shall be engineered and located in areas that best serve the community. These new water facilities and improvements shall be monitored annually and maintained by the appropriate agency or jurisdiction.

Hazardous Materials and Human-Caused Hazards

Manufacturing, transporting, and storing hazardous materials in the urban environment threaten the safety of persons working with such materials, as well as businesses and residences located near the hazards. The City recognizes the importance of identifying users and producers of these materials, and making land use decisions that minimize the risks associated with exposing people to hazardous materials.

GOAL 4.0: Minimize risks to life, property, and the environment associated with producing, using, storing, or transporting hazardous materials.

- Policy 4.1: Assess potential risks of disposing, transporting, manufacturing and storing existing hazardous materials, and develop appropriate mitigation measures in case of accidents.
- Policy 4.2: Prohibit new disposal, transport, manufacture, and storage of hazardous materials within the City without a mitigation plan in case of accidents. Hospitals meeting current State and federal standards are exempt.
- Policy 4.3: Identify hazardous materials dumpsites, and ensure that the sites are cleaned in conformance with applicable federal and State laws prior to the establishment of new uses.
- Policy 4.4: Ensure that the public is protected from fires, noxious fumes, and other hazards within the City's industrial area.
- Policy 4.5 Prohibit land uses that could exacerbate the risk of ignitions in High or Very High FHSZs, such as outdoor storage of hazardous or highly flammable materials, automobile service or gas stations, or temporary fireworks sales.

Aircraft Operations

The John Wayne Airport in Santa Ana, U.S. Army Airfield operations based in Los Alamitos, and helicopters serving various medical institutions in Orange generate high volumes of commercial and military aircraft traffic above the City. Potential hazards related to aircraft traffic include excessive noise and aircraft accidents.



- GOAL 5.0: Reduce safety hazards associated with civilian, military, and medical air traffic.**
- Policy 5.1: Work with the Federal Aviation Administration, the Orange County Airport Land Use Commission, California Department of Transportation, and other agencies to establish aircraft corridors which minimize the exposure of Orange residents to air traffic hazards.
- Policy 5.2: Work with major medical institutions to minimize the impact of helicopter and airplane traffic on Orange residents.

Emergency Services and Safety

The safety and well being of Orange’s neighborhoods and businesses is a valued, fundamental component of quality of life in the community. Orange will continue to sustain and improve its commitment to safety through a comprehensive approach to police and fire services, including public outreach and education, proactive preparedness planning, community awareness, and partnerships with public agencies and private businesses. Education will also be provided relative to homeland security issues. Foresight and planning regarding land use decisions represent proactive approaches to enhance safety in the community, especially in areas where future development may be more intense than current conditions. Potential rail hazards must also be recognized and prepared for. Industrial hazards such as noxious fumes, underground fuel lines, and other potential hazards must be evaluated and mitigated. Special attention must be given to industrial projects located near residential areas to ensure appropriate buffers and screening of industrial sites.

- GOAL 6.0: Provide public safety services of the highest quality.**
- Policy 6.1: Provide the Police Department with adequate personnel, equipment, and state-of-the-art technology to effectively combat crime, meet existing and projected service demands, and provide crime prevention programs. These resources should be provided prior to anticipated needs.
- Policy 6.2: Provide resources for additional police and fire services as needed to maintain average response times.
- Policy 6.3: Provide and use up-to-date technology to improve crime prevention, fire suppression, and emergency services.
- Policy 6.4: Continue to support, develop, and implement programs which improve the City’s approach to fighting crime.
- Policy 6.5: Provide ongoing public information and education regarding the City’s Emergency Preparedness Program, homeland security, and other similar programs.
- Policy 6.6: Utilize and update as necessary established designated evacuation routes throughout the City as identified on the Police Department Website and in the Fire Department Wildland Urban Interface pre-plan documents for wildfire incidents.



- Policy 6.7: Maintain and update the City’s Emergency Operations Plan as needed, and ensure ongoing consistency between the General Plan and the Emergency Operations Plan and Fire Department Strategic Deployment Plan.
- Policy 6.8: Establish and maintain optimal emergency response times for fire safety. Require new development to ensure that City response times and service standards are maintained.
- Policy 6.9: Continue to adopt and honor agreements with adjacent communities for mutual aid assistance.
- Policy 6.10: Continue to train, license, and/or certify Fire Department staff.
- Policy 6.11: Ensure that the Police and Fire Departments have complete and available emergency supplies, sufficient capacity, facilities, personnel, training, technology, equipment, adequate emergency vehicle access, crime fighting equipment, and fire suppression resources to meet growth needs for combating crime, providing fire protection, and providing related emergency services for all segments of the population, including vulnerable and disadvantaged communities, in all areas of the City.
- Policy 6.12: Maintain and improve disaster response and recovery capabilities to protect and meet the needs of all members of the community, including the most vulnerable and disadvantaged.

Crime Prevention

Preventing crime through public outreach and education and designing new spaces to promote secure streets and public places can both improve the quality of life enjoyed by Orange residents. The Police Department works with the community to promote safety by increasing awareness of personal and property crime risks. Crime prevention also involves educating the public about personal safety, business and neighborhood watch programs, and residential and business security.

Defensible space planning is another crime prevention method. Defensible space planning uses design techniques, building orientation, and features of the built environment to deter criminal activity and positively influence human behavior. Defensible space planning is also a key element in a local comprehensive crime prevention and safety plan. Crime Prevention through Environmental Design (CPTED) techniques incorporate four key considerations into site planning and architectural design: territoriality, natural surveillance, activity support, and access control.

GOAL 7:0: Improve community safety and reduce opportunities for criminal activity.

- Policy 7.1: Provide crime prevention, community service, and education programs designed to prevent crime.
- Policy 7.2: Promote and integrate crime-preventive characteristics and design features into all phases of the planning and development process.
- Policy 7.3: Maximize natural surveillance through physical design features, including, but not limited to, visible entryways from surrounding structures and businesses;



- well-defined and visible walkways and gates; well-lighted driveways, walkways, and exteriors; and landscaping that preserves or enhances visibility.
- Policy 7.4: Ensure that community areas and amenities such as transit stops, sidewalks, plazas, parks, trails, public parking facilities, and bike paths are appropriately lighted, free of hiding places, and frequently patrolled.
 - Policy 7.5: Maximize security of public spaces, recreation facilities, and new development by encouraging complementary uses that support a safe environment.
 - Policy 7.6: Continue to involve the Orange Police Department in the project design and review process.

Disaster/Emergency Preparedness

The City recognizes that emergency preparedness planning can reduce the impact of hazards resulting from a natural or human-caused disaster.

- GOAL 8.0: Emphasize emergency preparedness throughout both the City organization and the community.**
- Policy 8.1: Sponsor and support public education programs for emergency preparedness and disaster response. Continue to provide a Community Emergency Response Team (CERT) program through the Police Department to support emergency awareness and preparedness for the Orange community, particularly for vulnerable and disadvantaged communities.
- Policy 8.2: Coordinate disaster preparedness with other public and private agencies.
- Policy 8.3: Coordinate emergency response and preparedness planning with other cities and public agencies in the region.
- Policy 8.4: Develop and maintain a fully functioning Emergency Operations Center, and adequate and up-to-date emergency preparedness resources and plans.
- Policy 8.5: Maintain the City’s mass emergency notification mechanism for the release of public information during a major event and seek methods to achieve effective notification to disadvantaged and vulnerable communities.

Pedestrian and Bicycle Safety

A walkable city is achieved by creating safe streets and travelways. Establishing a feeling of safety is key to encouraging the use of trails, pedestrian paths, sidewalks, and bikeways to move about the community.

- GOAL 9.0: Provide safe pedestrian and bicycle environments.**
- Policy 9.1: Enhance and maintain safe pedestrian and bicycle movement through the integration of traffic control devices, crosswalks, and pedestrian-oriented lighting, into the design of streets, sidewalks, trails, and school routes throughout Orange.

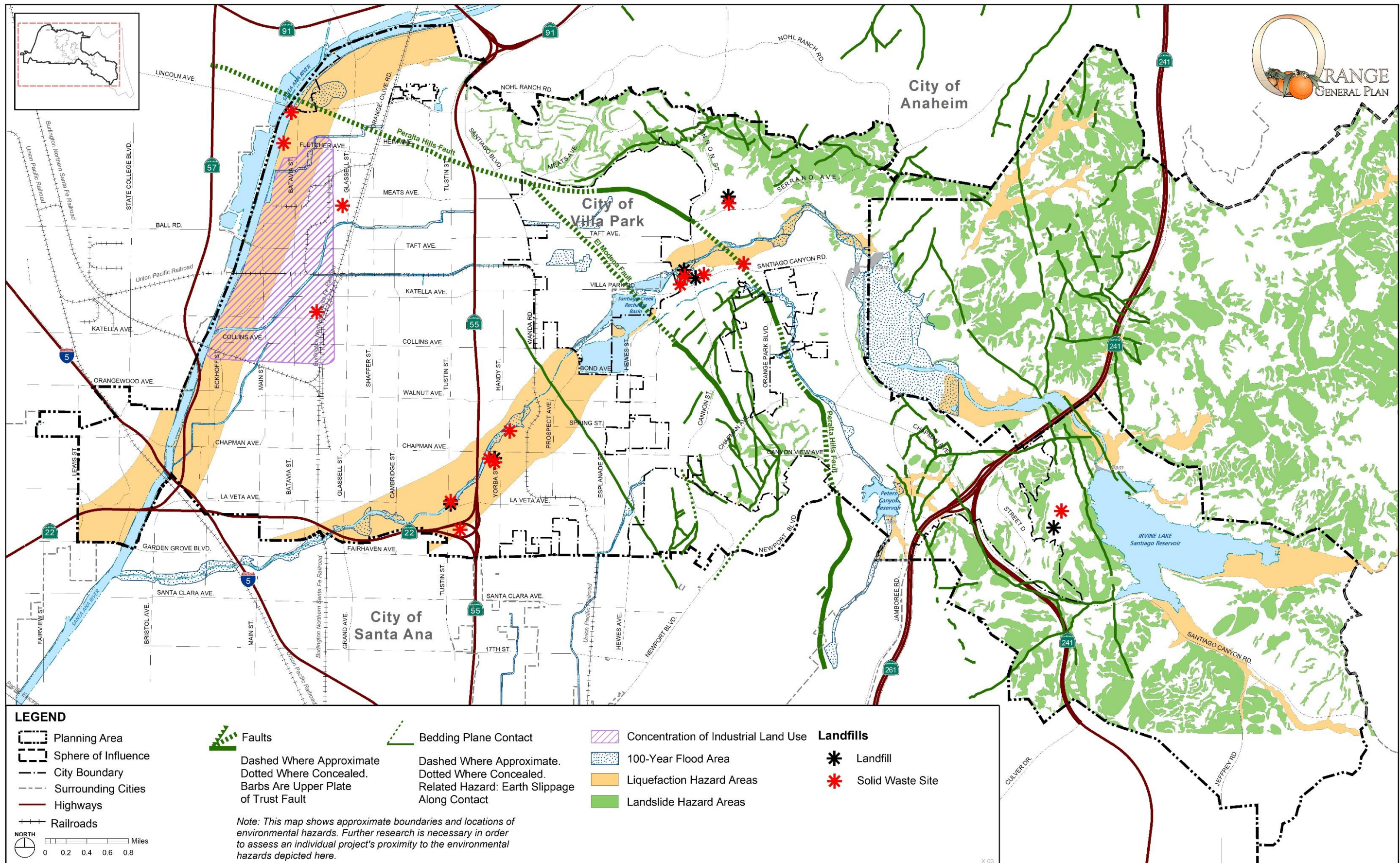


- Policy 9.2: Support creation of safe routes that encourage children and adults to walk or bike to schools and recreational facilities.
- Policy 9.3: Identify and attempt to remove impediments to pedestrian and bicycle access including those associated with rail, street, freeway, and waterway crossings and poorly marked or maintained pathways and sidewalks.

PUBLIC SAFETY PLAN

As in all communities, human activities and natural conditions occurring in Orange have an effect on residents' quality of life. It is essential not only to provide an environment where businesses and residents can prosper and feel safe, but also to be prepared for emergency situations. The City can minimize hazards and protect public health and private property through a combination of appropriate land use planning and development review, and emergency preparedness planning.

Figure PS-1 presents graphically the City's safety policies and plans related to environmental and natural hazards. The Environmental and Natural Hazard Policy Map presents the locations of known seismic, geologic, flood, and landfill hazards. Figure PS-2 shows the Very High Fire Hazard Severity Zones in the Local and State Responsibility Areas. Figure PS-3 shows the City Wildland Urban Interface pre-plan areas. As applicable, the Public Safety Plan refers to these maps for identification of significant locations, conditions, or development requirements.



Note: Large format map available at the Community Development Department / Source: Federal Emergency Management Agency 2000, Source: California Department of Conservation 2007, California Integrated Waste Management and California Energy Commission 2003

Figure PS-1. Environmental and Natural Hazard Policy Map
 Revised : January 13, 2022



Geologic and Seismic Hazards

Like many cities in Southern California, Orange faces geologic and seismic hazards, specifically earthquakes, earthquake-induced landslides, and liquefaction. The planning area encompasses two general types of terrain: an alluvial plain that underlies the central and western parts of the City, and a series of low hills (foothills of the Santa Ana Mountains) characteristic of the east side of the City and the Sphere of Influence. Generally, the alluvial plain is underlain by many thousand feet of fluvial and floodplain sediments, and certain areas of the plain adjacent to major watercourses (the Santa Ana River and Santiago Creek) are susceptible to flooding and seismically-induced liquefaction. However, the potential for landslides is low due to the limited relief of the alluvial plain. Conversely, the hilly section is underlain by bedrock (mostly late Tertiary marine and non-marine sediments); this area is generally less susceptible to liquefaction but certain areas may be prone to earthquake-induced landslides, depending upon the character of the underlying bedrock.

Earthquakes

An earthquake is a manifestation of the constant movement and shifting of the earth's surface. Movement occurs along fractures or faults, which represent the contact point between two or more geologic formations. Earth movement, known as seismic activity, causes pressure to build up along a fault, and the release of pressure results in the ground-shaking effects we call an earthquake.

Earthquake magnitude generally is measured on a logarithmic scale known as the Richter Scale. This scale describes a seismic event in terms of the amount of energy released by fault movement. Because the Richter Scale expresses earthquake magnitude in scientific terms, it is not readily understood by the general public. The Modified Mercalli Scale, on the other hand, describes the magnitude of an earthquake in terms of actual physical effects. Table PS-1 compares Modified Mercalli Scale intensities to Richter Magnitude Scale intensities.

Fault Rupture

The potential for fault rupture would exist along the traces of active faults. No known Alquist-Priolo fault zone is located in the Orange planning area. However, as shown on Figure PS-1, portions of the planning area are traversed by two faults: the Peralta Hills Fault and the El Modena Fault. The Peralta Hills Fault runs from the crossing of Lincoln Avenue over the Santa Ana River on the northwest, easterly along the base of the Peralta Hills and into the City of Villa Park, then southerly into the hills west of Peters Canyon Reservoir. The El Modena Fault runs from its intersection with the Peralta Hills Fault at the base of the Peralta Hills, southeasterly to Chapman Avenue. Both the Peralta Hills Fault and the El Modena Fault are classified as possibly active by the Southern California Earthquake Data Center. Displacements along these two faults are smaller than those along the more prominent regional faults, and the maximum probable earthquake magnitudes would be much less than those along the regional faults. The City will continually update development standards and adopt the latest building construction codes to minimize seismic and related geologic hazards associated with these faults.



Table PS-1 Earthquake Magnitude and Intensity Comparison		
Descriptor	Richter Magnitude	Modified Mercalli Index Intensity - Description
Not felt	Lower than 3.0	I. Not felt except by very few persons under especially favorable conditions.
Weak	3.0 - 3.9	II. Felt only by a few persons at rest, especially on upper floors of high-rise buildings. Delicately suspended objects may swing. III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibrations like passing of a truck.
Light	4.0 - 4.9	IV. During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
Moderate		V. Felt by nearly everyone; many awakened. Some dishes and windows broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
Strong	5.0 - 5.9	VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved, few instances of fallen plaster and damaged chimneys. Damage slight.
Very strong		VII. Everybody runs outdoors. 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. Noticed by persons driving cars.
Severe	6.0 - 6.9	VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed.
Violent		IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
Extreme	7.0 - 7.9	X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.
	8.0 and higher	XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly. XII. Damage total. Waves seen on ground surface. Lines of sight and level are distorted. Objects thrown into the air.

Source: United States Geological Survey National Earthquake Information Center, October 2002.

Ground Shaking

Orange is vulnerable to ground shaking caused by seismic events along large regional faults in the area. These faults include the Newport-Inglewood Fault (located approximately 15 miles southwest of Orange along the coast near Newport Beach), the Elsinore Fault (which crosses the Santa Ana River Canyon about five miles northeast of Orange), and the San Andreas Fault



(which is parallel to the Elsinore, located approximately 40 miles northeast of Orange). Each of these faults has numerous branches and associated faults and, therefore, has associated fault zones. Movement along any of these fault zones has the potential to cause widespread upset in Orange. The potential for ground shaking within the City depends on the distance to the fault and the intensity of a specific seismic event along the fault. Also, areas underlain by bedrock at shallow depths (as in the eastern part of the planning area) would tend to be less affected than areas underlain by thick sequences of unconsolidated alluvium.

Figures PS-2 and PS-3 show the effects of two maximum probable events, a magnitude 8.3 earthquake along the San Andreas Fault and a magnitude 7.5 earthquake along the Newport-Inglewood Fault. The ground-shaking effects on areas within Orange are shown in terms of the Modified Mercalli scale (See Table PS-1). The maximum Mercalli intensity, IX, at the southwest corner of the city under a 7.5 magnitude Newport-Inglewood fault scenario, indicates potential for great damage to substantial buildings and damage to underground pipes even in specially designed structures.

Landslides and Liquefaction

Landslides can occur when strong ground movement such as an earthquake shakes loose soil and causes land and debris to lose stability and slide. Liquefaction occurs when moisture-saturated soils lose stability during seismic conditions. Structures built on such soils may collapse and result in damage and loss.

Portions of the planning area most susceptible to liquefaction and landslides are identified on the Environmental and Natural Hazards Policy Map (Figure PS-1). Earthquake-induced landslides are most probable in poorly consolidated or semi-consolidated sedimentary rock, characteristic of the low hills of the northern and eastern parts of the planning area. Portions of the planning area susceptible to seismically-induced liquefaction include areas near the Santa Ana River and Santiago Creek. A smaller area of high liquefaction potential is present in the areas east of Panorama Heights, in Crawford Canyon. These alluvial plains are characterized by fluvial and loose, floodplain sediments.

To further protect the City from injury and structural damage due to geologic and seismic hazards, all new development will be required to abide by the most recently adopted City and state seismic and geotechnical requirements. All older buildings, particularly unreinforced masonry buildings, and buildings located near the Peralta Hills and El Modena Faults should be reinforced and strengthened to prevent damage to structures and loss of life in the event of an earthquake. The City will provide public education programs regarding geologic and seismic hazards and continue to cooperate with surrounding cities, regional, State, and federal government in programs designed to implement the most strategic and efficient actions to mitigate such hazards.

Flood Hazards

In Orange, flooding may result from either the overflow of watercourses due to excessive and unusual storm run-off, or from failure of dams and/or water storage reservoirs.



Natural Flood Hazards

Flood hazards related to storm events generally are described in terms of the “100-year flood.” As its name implies, the 100-year flood is the largest flood event which may be expected to occur within a 100-year period. This flood is considered a severe flood but one which can be reasonably predicted and therefore reasonably mitigated. As shown in Figure PS-1, the 100-year flood plains shown in Federal Emergency Management Agency (FEMA) maps indicate that the stream drainage areas along the Santa Ana River and Santiago Creek are subject to flooding by the largest storm event in 100 years or within 100 to 500 years. The floodplain may be subject to modification by manmade facilities such as flood control basins, levees, and concrete-lined stream channels.

Additionally, according to FEMA maps, a flood area determined for the 100-year storm event (Zone A) is a reservoir water surface elevation of approximately 800 feet mean sea level (msl) as shown. Backwater into Santiago Creek, Limestone Creek, and immediately adjacent to Santiago Reservoir tributary drainage also reaches this elevation. As development in the hillside and basin areas progresses, runoff and absorption rates will be altered. Adequate infrastructure will be needed to ensure that the increased runoff can be handled without increasing the risk of flooding. Appropriate flood control measures will be implemented along Santiago Creek and throughout the planning area, where necessary, to reduce the risks from localized flooding.

The National Flood Insurance Program, in which Orange participates, covers at a minimum all properties affected by the 100-year flood. To receive insurance benefits in the event of a flood, participating agencies must recognize these official flood boundaries and establish appropriate land use policy for the flood zones.

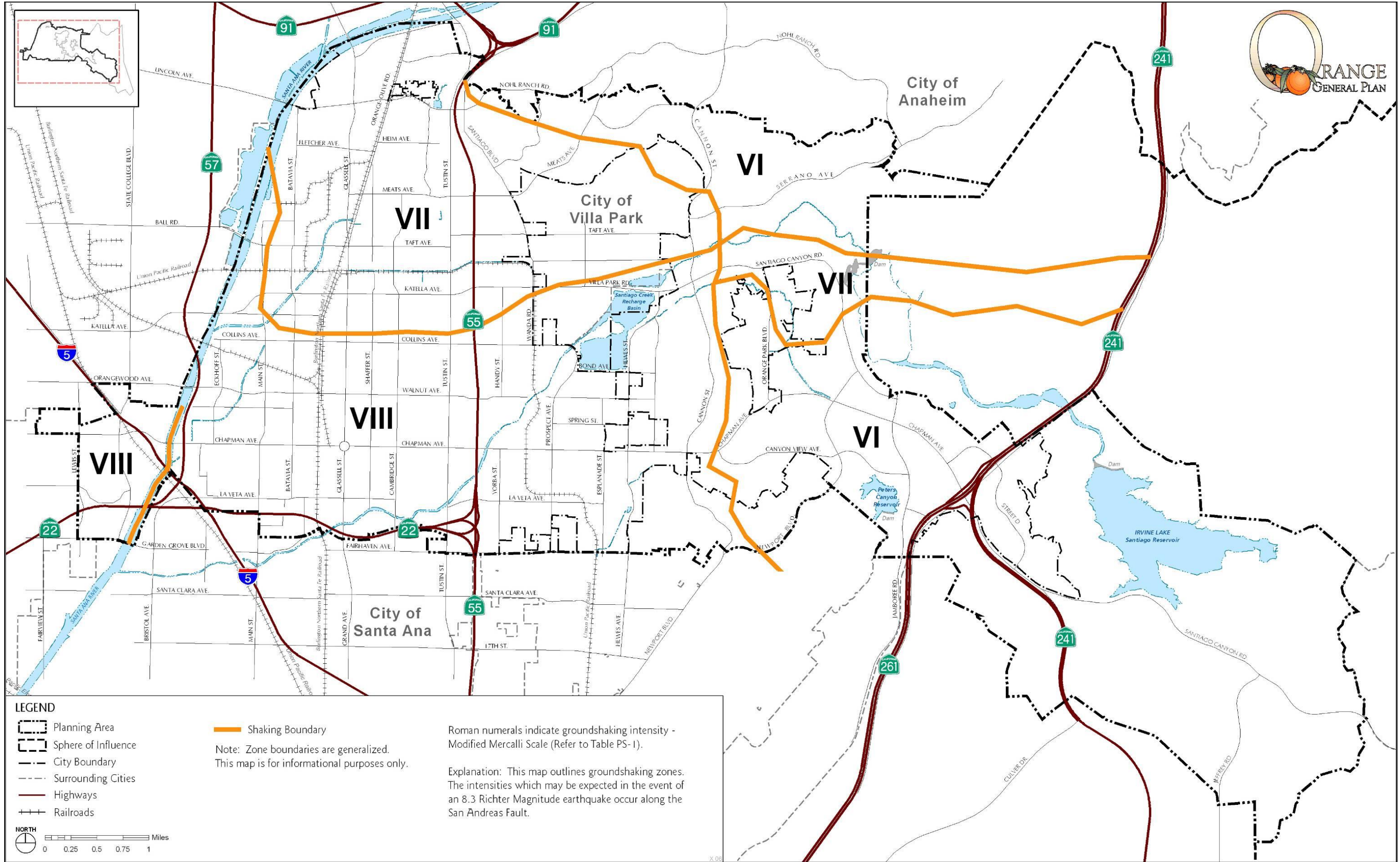
Additional flood prevention methods such as provision of detention basins and on-site stormwater drainage will be required of developers to reduce runoff into the City’s drainage facilities and to provide adequate drainage for new developments. To minimize runoff, the City will promote developments that incorporate permeable surfaces within site design.

The City will direct development of critical public and private facilities such as medical, educational, and civic facilities to be located outside of flood zones. To mitigate flood hazards to existing structures within flood zones, the City will offer educational programs for the public and City staff regarding flood hazards.

Flood hazards can be created or heightened after wildland fire events. Post-fire systems are implemented on an as-needed basis following a wildland fire. Potential problem areas are identified by the City, then Orange County Public Works best practices along with National Pollution Discharge Elimination Systems guidelines are implemented to mitigate potential flooding.

Dam Inundation Hazards

Failure of the Prado Dam in Corona (in Riverside County) could result in extensive flooding along the Santa Ana River. However, ongoing efforts by the Army Corps of Engineers to improve the Prado facility reduce the risk of dam failure to a very low level.



LEGEND

- Planning Area
- Sphere of Influence
- City Boundary
- Surrounding Cities
- Highways
- Railroads

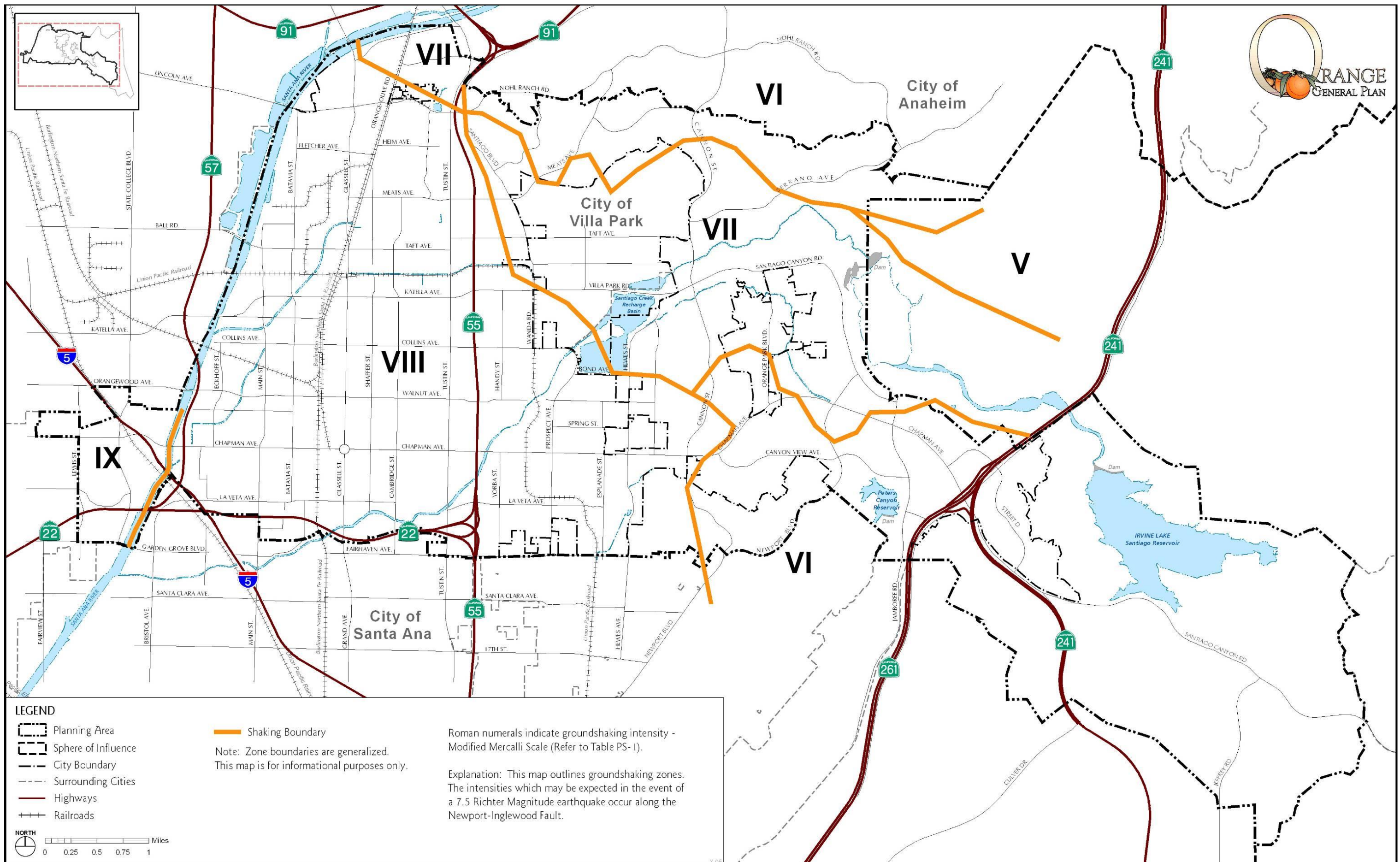
Shaking Boundary

Note: Zone boundaries are generalized.
This map is for informational purposes only.








Roman numerals indicate groundshaking intensity - Modified Mercalli Scale (Refer to Table PS-1).

Explanation: This map outlines groundshaking zones. The intensities which may be expected in the event of an 8.3 Richter Magnitude earthquake occur along the San Andreas Fault.

Figure PS-2. Potential Groundshaking Zones – 8.3 San Andreas Earthquake



LEGEND

-  Planning Area
-  Sphere of Influence
-  City Boundary
-  Surrounding Cities
-  Highways
-  Railroads
-  Shaking Boundary

Note: Zone boundaries are generalized. This map is for informational purposes only.

Roman numerals indicate groundshaking intensity - Modified Mercalli Scale (Refer to Table PS-1).

Explanation: This map outlines groundshaking zones. The intensities which may be expected in the event of a 7.5 Richter Magnitude earthquake occur along the Newport-Inglewood Fault.

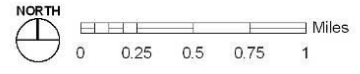


Figure PS-3. Potential Groundshaking Zones – 7.5 Newport-Inglewood Earthquake



Two dams are present along Santiago Creek: Villa Park Dam and Santiago Dam (Irvine Lake). Both are located in the foothills section of east Orange. Peters Canyon Dam is located along Peters Canyon about two miles west of Irvine Lake. Like Santiago Creek, which flows generally southwest, Peters Canyon drains in a similar direction, along Handy Creek and ultimately into Santiago Creek. The areas below (downstream from) the dams are areas of potential flood hazard in case of catastrophic dam failure, which presumably could result from a major earthquake. Maps depicting the extent of potential dam inundation within the planning area are available for public review at the Community Development Department. The areas below the dams are also zoned for flood hazard on the FEMA maps, and the areas of potential flooding are similar in width to other areas along Santiago Creek and Peters Canyon (see Figure PS-1). Should one of these facilities fail, properties along Santiago Creek and a large section of Old Towne could be flooded. Flood flows would move at rates which would allow persons to be evacuated, but significant property damage could result. However, as is the case for Prado Dam, these facilities are maintained and safety-inspected to ensure that risks are minimized.

Olive Hills Reservoir is a water tank which sits on a hilltop in Anaheim above residential development in Orange. Reservoir failure would result in the flooding of canyons and residential tracts below the reservoir.

The City will minimize flood-related risks and hazards in the event of dam or reservoir failure, protecting residences and businesses by encouraging the County's Flood Control District to continue proper inspection of storm drains, ensure maintenance of the flood control facilities, and prevent earthquake damage. The City will also monitor water storage facilities to determine potential inundation hazards to surrounding properties.

Fire Hazards

As part of its efforts to prevent injury and loss due to fire hazards in the Very High Fire Hazard Severity Zones (VHFHSZ), Wildfire Urban Interface (WUI), undeveloped hillside, and urban areas, the City will continue to educate the public, provide up-to-date maps, and refine pre-plan WUI areas delineating areas that could face fire hazards. The City will ensure minimum road widths, clearance areas, and access to adequate fire protection services by enforcing Municipal Code provisions and City specifications, and conducting development review.

Wildfires

The Very High Fire Hazard Severity Zones Map (Figure PS-4) shows Very High Fire Hazard Severity Zones in the Local Responsibility Area and State Responsibility Area and also shows the boundaries of the Natural Communities Conservation Plan/Habitat Conservation Plan. Risks associated with fire hazards at these Wildfire Urban Interfaces are reduced through fire prevention which includes, public education, development standards for new construction, annual inspections, State fire clearances, and fuel modification and weed abatement coordinated through or conducted by the Fire Department as outlined under the Emergency Services and Safety heading on the following pages.

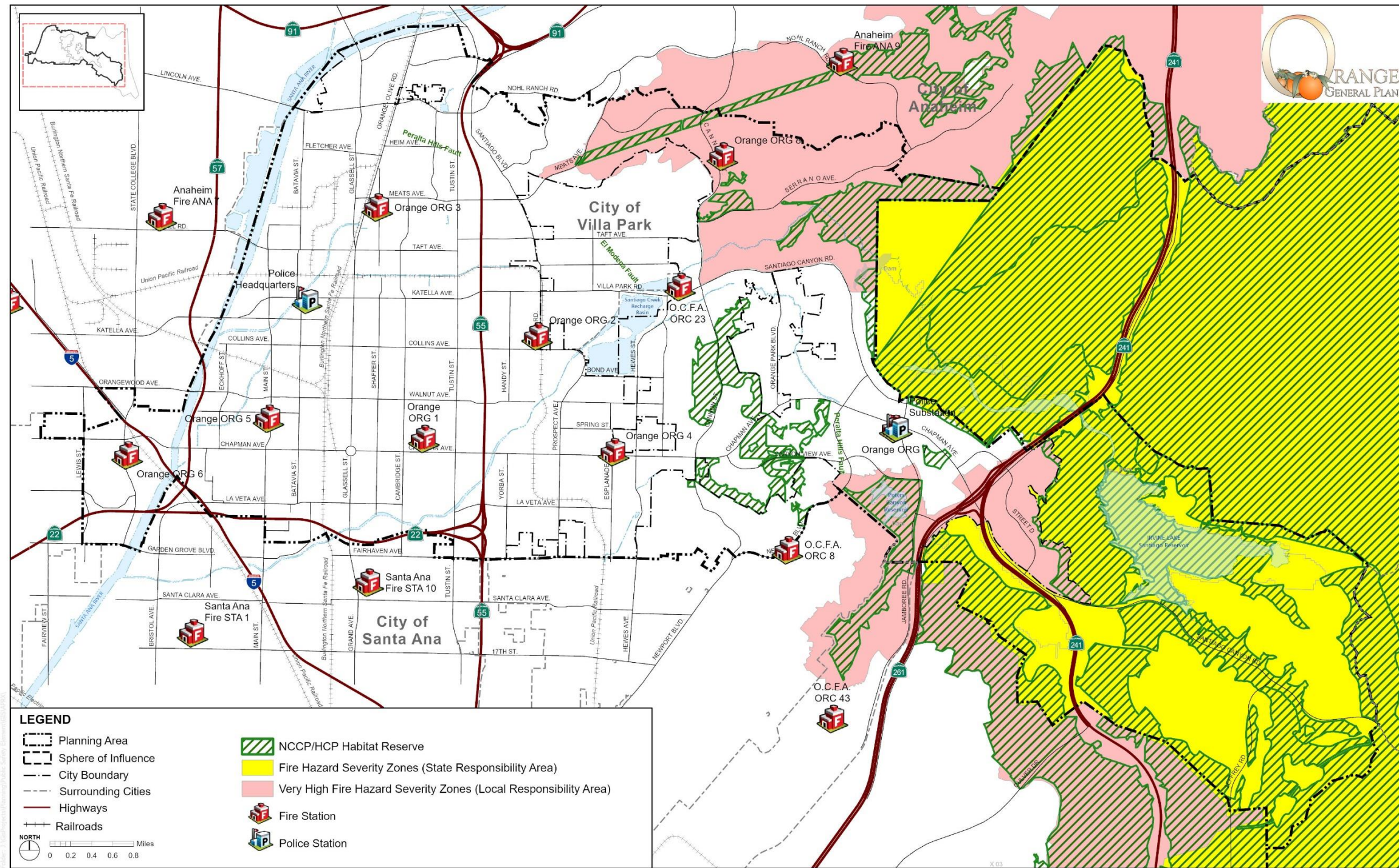


Figure PS-4. Very High Fire Hazard Severity Zones Map



Development located within or adjacent to the identified Very High Fire Hazard Severity Zones (VHFHSZ) and Wildfire Urban Interface (WUI) in Figure PS-4 must prepare and implement a comprehensive fuel modification program in accordance with City regulations. Most of the City is developed outside of the VHFHSZ, however Figure PS-4 shows existing and proposed land uses within the VHFHSZ. Figures PS-6a and PS-6b show existing development in the VHFHSZ that has a single emergency evacuation route and also shows entitled projects that are either in or partially in the VHFHSZ. The City reviews new developments for appropriate fire services needs to ensure adequate emergency services and facilities to residents and businesses. Coordinating with adjacent local cities, and participating in regional, State, and federal programs assist in preparing the City for wildfire emergencies and help reduce fire-related risks.

For localized wildfire incidents, the Fire Department implements the following WUI pre-plans:

- Tustin-Orange Foothills Fire Plan
- Anaheim Hills East
- Anaheim Hills West
- Cowan Lemon Heights
- East Orange-Orange Park Acres

These WUI plans are identified in Figure PS-5 and include the following:

- A risk assessment of the areas covered
- Critical information such as response safety, aviation hazards, potential choke points/entrapments
- Briefing information such as fuels, years burned, expected fire behavior, topography, access, special hazards, safety zones/temporary safe refuge areas, and water supply
- Unified command information such as potential incident command post locations, unified command participants, and staging areas
- Large fire development factors such as weather and fire behavior
- WUI arrangement
- Recommended strategies and tactics (FIREScope/PACE) including a primary plan (offensive), alternate plan (offensive), contingency plan (defensive – responder safety), emergency plan (defensive), and perimeter control plan
- An evacuation plan including a primary evacuation plan, evacuation trigger points, and temporary evacuation assembly points for humans and animals
- Population and structures at-risk by population, acreage, and structures
- Structural Triage showing percent of threatened/non-defensible areas, threatened/defensible areas, non-threatened areas, and areas with defensible space
- Fire emergency resource needs for the first six hours including the fire ordering point; the number of engines, strike teams, water tenders, crew, dozers, overhead division support, and aircraft needed; and, the risk to WUI engine deployment
- Law enforcement emergency resource needs for the first six hours including the law enforcement ordering point; number of officers from various agencies for evacuation,



traffic control and security, traffic control points, logistics needs for emergency operation center support, and other considerations

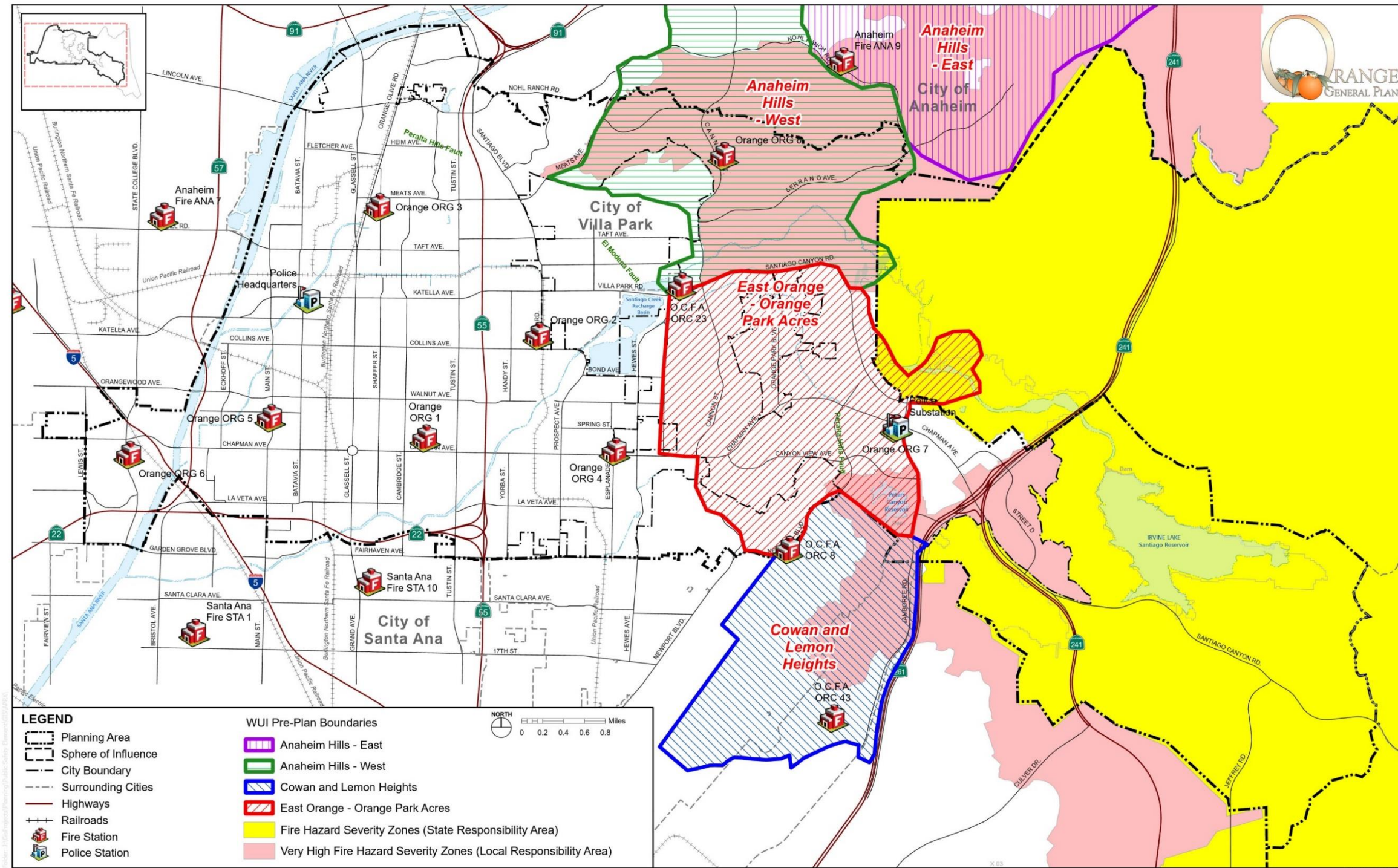
- Maps showing topography, access, hazards such as electrical and aerial, base camps, water sources, evacuations areas and routes, fuel breaks, spotting problems, proposed dozer lines, forecast fire progression in major paths and arrival time, and other necessary information

The City participates in the county-wide Community Wildfire Protection Plan for Orange County. This plan addresses pre-suppression, suppression, and post-suppression tactics in the Natural Communities Conservation Plan/Habitat Conservation Plan areas within the City as identified on Figure PS-4. The suppression tactics identify desired actions and locations, while the post-suppression tactics identify the actions and responsibilities for fire suppression repair consistent with the Natural Communities Conservation Plan/Habitat Conservation Plan. The plan is the conduit to discuss and develop pre-suppression and prevention activities to reduce the loss of life, property, environment, and suppression costs.

The City is also a participant in mutual aid via the SOLAR plan, the mutual aid agreement between the counties of San Bernardino, Orange, Los Angeles, and Riverside County fire agencies to provide for common radio communications and a central ordering point (dispatch center) for resources during emergencies.

Urban Fires

Although updated fire code requirements reduce urban fire risks in Orange, structures in older parts of the City, especially in Old Towne, were constructed prior to adoption of modern standards. Structures used for the transport, production, and handling of combustible equipment in the industrial areas (shown in Figure PS-1) also pose a credible urban fire threat. The Fire Department will participate in environmental review procedures to reduce urban fire risks in these areas, and will help educate the public regarding fire prevention.



Note: The Tustin-Orange Foothills Fire Plan area encompasses much of the other WUI Pre-Plan boundaries. The map area is on file with the Fire Department.

Figure PS-5. Wildland Urban Interface (WUI) Pre-Plan Map

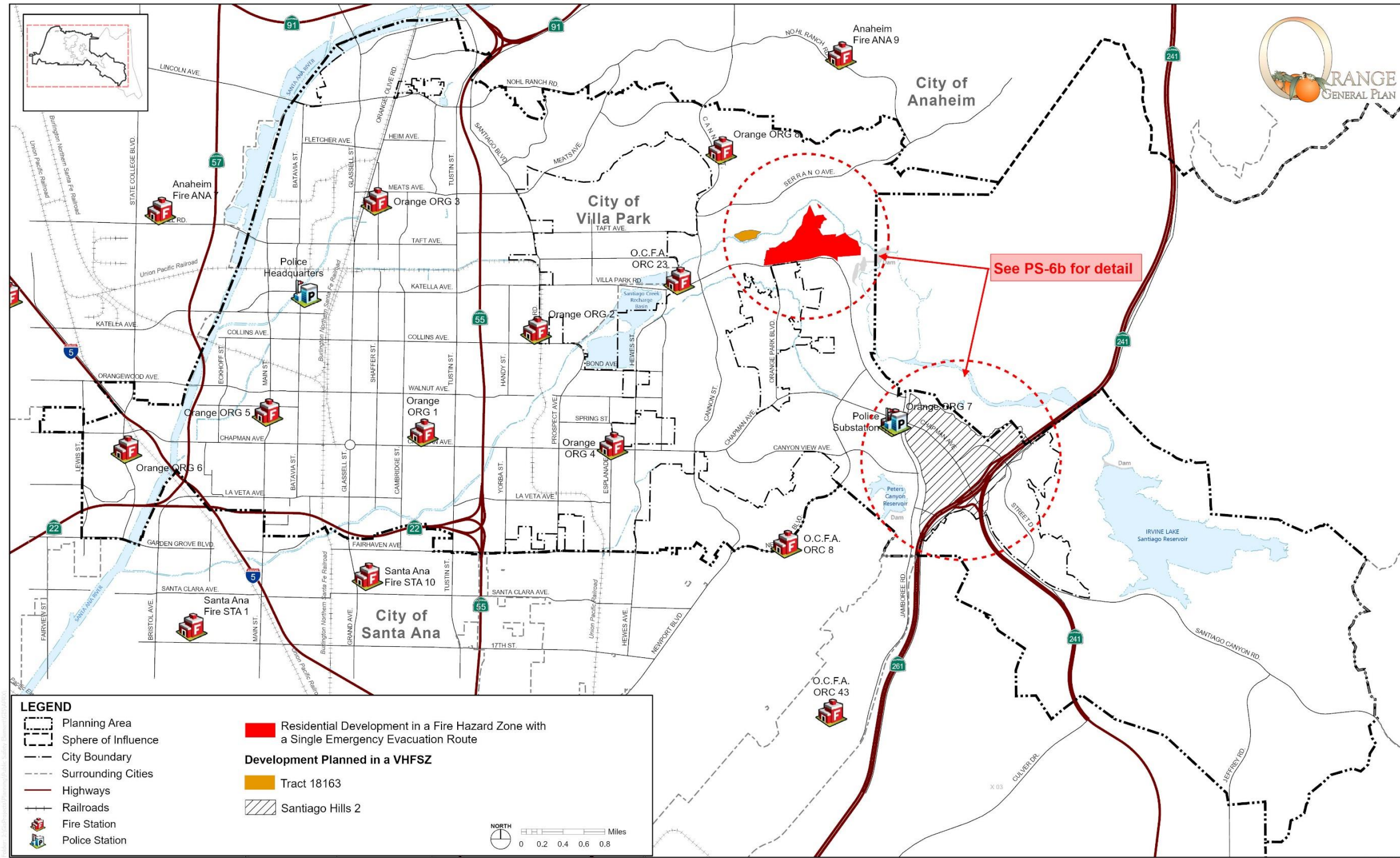


Figure PS-6a. Residential Development in a Fire Hazard Zone with a Single Emergency Evacuation Route and Development Planned in a VHFHSZ map

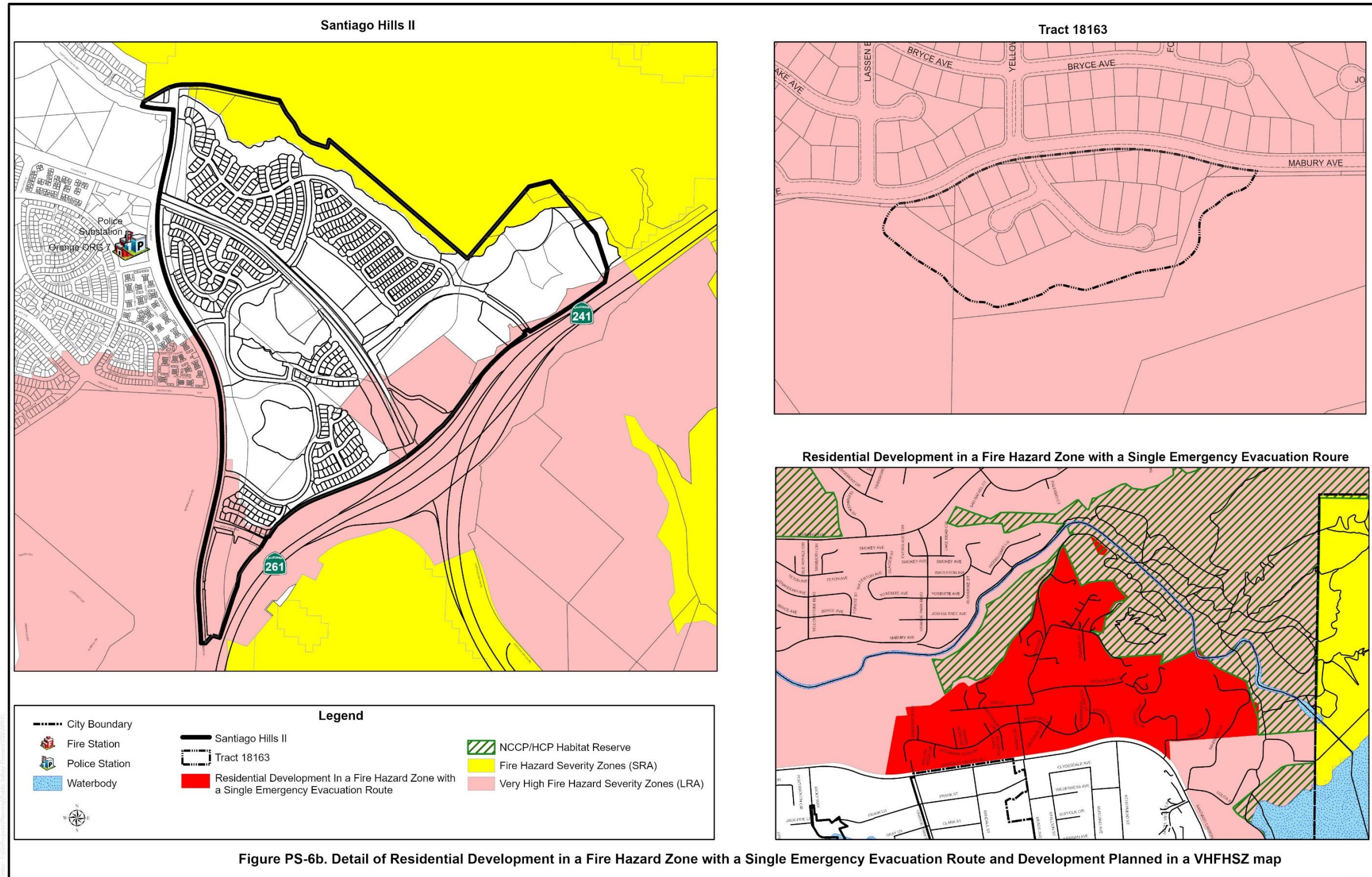


Figure PS-6b. Detail of Residential Development in a Fire Hazard Zone with a Single Emergency Evacuation Route and Development Planned in a VHFHSZ map

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Hazardous Materials and Human-Caused Hazards

Hazardous materials are often found in solid, liquid, and gas forms that pose potential threats or actual harm to humans and the environment. Mishandled hazardous materials can leak into soils and water sources.

Hazardous Materials

The City follows the County's Hazardous Materials Inspection and Enforcement Plan. To prevent accidents, and ensure proper handling, routine inspections are conducted at businesses within the City that store, use, or handle hazardous materials. The City concentrates production of hazardous materials within its industrial area, separated from residential areas, educational uses, and institutional facilities (see Figure PS-1). The City also identifies businesses transporting, manufacturing, using, and storing hazardous chemicals, and requires such businesses to exercise caution and to mitigate potential negative effects on surrounding land uses prior to obtaining businesses licenses. Periodic assessment and analysis of potential threats related to hazardous materials will result in proper response to hazardous substance emergencies. In addition, plans for residential or for mixed-use projects on industrial or commercial lands will be required to undergo proper site assessment and remediation prior to development.

Residents may dispose of hazardous materials at the Household Hazardous Waste Collection Center in the City of Anaheim. Since the three landfill sites serving Orange (located in Irvine, Brea, and San Juan Capistrano) do not accept hazardous wastes, commercial hazardous wastes must be collected and disposed by private waste disposal companies.

Solid Waste Disposal Sites

Areas formerly used as landfills contain wastes that can release toxins into the air or contaminate groundwater. As indicated in Figure PS-1, the planning area includes several closed landfills.

Those landfills as named on the County website are:

- Cerro Villa, located 1/4 mile east of Cannon Street between E. Serrano Avenue and East Goldenrod Lane
- La Veta, located on the northeast corner of La Veta and Tustin Avenues.
- Reeve Pit, located at the northeast corner of Villa Park Road/East Santiago Canyon Road and North Hewes Street
- Santiago Canyon, located off Santiago Canyon Road, east of the intersection of the SR 261 and SR 241, adjacent and westerly of Irvine Lake. The physical address is 3099 Santiago Canyon Road.
- Villa Park, located south of the Santiago Creek on the northeast corner of Santiago Canyon Road and Cannon Street in the City of Orange. The physical address is 5545 E. Santiago Canyon Road.



- Yorba, located at the southwest corner of Chapman Avenue and Yorba Street in the City of Orange. The physical address is 190 S. Yorba Street.

In addition to the aforementioned closed landfills, the planning area has solid waste sites listed on the State’s Solid Waste Information System (SWIS). These sites are indicated in Figure PS-1, and consist of the following:

- Blue Ribbon Nursery & Landscape Supplies, 1425 N. Santiago Boulevard
- CalTrans Orange Maintenance Station LVTO, 691 S. Tustin Street
- Cerro Villa Heights Disposal Station #7, 5850 E. Crest De Ville
- City of Orange Santiago Creek Landfill, 190 S. Yorba Street
- City of Orange Corporate Yard LVTS Op., 637 West Struck Avenue
- La Veta Station #2, 465 S. Tustin Street
- Orange City Dump #9 , North of Chapman Avenue & Yorba Street, North of Chapman Global Medical Center
- Reeve`s Pit , 19111 Villa Park Road
- Rio Santiago, 6145 E. Santiago Canyon Road
- Santa Ana Valley Irrigation Dump #1 (abandoned), East Bank of the Santa Ana River, South of Lincoln Avenue, West of River Trail Road
- Santa Ana Valley Irrigation Dump #2 (abandoned), East Bank of the Santa Ana RiverS Of Lincoln And Batavia
- Santiago Canyon Sanitary Landfill, 3099 Santiago Canyon Road
- Villa Park (Loma Street) Landfill, Orange Co. Disp. Site No.22-Villa Park
- Waste Management Of Orange, 2050 Glassell Street
- Yorba Landfill, southwest corner of Chapman Avenue and Yorba Street in the City of Orange. The physical address is 190 S. Yorba Street.

The City will require appropriate site assessment and mitigation of hazardous toxins prior to development. If areas pose hazards that cannot be adequately mitigated, they will be designated as open space.

Pipelines

Several high pressure pipelines pass through Orange, delivering natural gas, liquid petroleum, and other products to Orange and cities beyond. Hazards associated with the pipelines include gas leaks, fire, and seepage of materials into the ground. The City Fire Department maintains maps indicating the location of these facilities, and uses these maps for safety planning, incident response, and development review purposes.

Underground Storage Tanks

The City’s Fire Department has primary responsibility for managing risks associated with the presence of underground storage tanks (USTs). In addition to following the County’s Inspection and Enforcement Plan, the Fire Department is also a participating agency in the local Certified Unified Program Agency (CUPA) established by the California State Water Resources Control Board. The City’s Fire Department implements State requirements for USTs. The overall purpose of the UST Program is to protect public health and safety and the



environment from releases of petroleum and other hazardous substances from tanks. The Hazardous Materials Specialists Leak Prevention Program element includes requirements for tank installation, construction, testing, leak detection, spill containment, and overflow protection. CUPAs are the implementing agencies for the Leak Prevention program element.

Cleanup of leaking tanks often involves a soil and groundwater investigation and remediation, under the direction of a regulatory agency. Responsible parties who believe cleanup at their site is complete and are denied case closure by the regulatory agency may consider filing a closure petition.

Aircraft Operations

The planning area is not located within any airport crash zones. However, because aircraft paths cross air space between the Costa Mesa Freeway (SR 55) and Newport Boulevard, the City is vulnerable to mid-air collisions of aircraft headed for John Wayne Airport or the U.S. Army Airfield in Los Alamitos, and of helicopters flying to medical centers. Such accidents could result in injury and structural damage to residents, homes, employees, and businesses in Orange. To minimize the chance of such aircraft collisions, the City will work with the Federal Aviation Administration, the Orange County Airport Land Use Commission, California Department of Transportation (Caltrans), major medical institutions, and other agencies to ensure aircraft use flight paths that minimize the City's exposure to potential accidents.

The City will comply with the Airport Land Use Commission (ALUC) for Orange County's Heliports and Airport Environs Land Use Plan to ensure that future land uses located near helipads remain compatible. This plan requires that the construction of a new heliport or helistop complies with FAA and Caltrans permit procedures, as well as all applicable requirements of the City of Orange. Additionally, the plan requires that construction or alteration of structure in excess of 200 feet in height complies with federal and State law (FAR Part 77 and PUC 21676(b), respectively) and with the requirements of the Airport Land Use Commission for Orange County, as well as all applicable requirements of the City of Orange.

The City will ensure that development proposals including the construction or alteration of a structure more than 200 feet above ground level must fully comply with procedures provided by federal and State law, with the referral requirements of the ALUC, and with all conditions of approval imposed or recommended by the FAA and ALUC including filing a Notice of Landing Area Proposal (Form 7480-1). This requirement will be in addition to all other City development requirements.

Emergency Services and Safety

Achieving ideal law enforcement and emergency services requires coordination between the services provided by the City and the demands of the community. The City will first work with the community to identify the level of services desired. Then, the City will assess existing and future police and fire services, facilities, equipment, and personnel to determine its ability to meet current and future demands. The City's Police and Fire Departments will continue to use public outreach and education to increase community awareness regarding hazards, the City's Emergency Preparedness Program, and homeland security in Orange. In addition, the City will support programs that address crime and fire prevention activities. The Police and Fire



Departments will continue proactive training and planning programs, and utilize state-of-the-art technology to improve response and increase public safety.

Fire Services

The main goals of the Fire Department are to prevent and minimize death and injury, environmental damage, and property loss. In addition to fighting fires, the Fire Department works to achieve these goals through public education, fire prevention, hazardous materials management, and fire investigations. Orange’s Fire Department provides fire, paramedic, and ambulance services. Paramedic teams are located at eight stations, of which four also provide ambulance service with an average response time of 4 minutes, 47 seconds; and average transport unit response times of 5 minutes, 15 seconds. The Fire Department employs fire fighters who are also trained in paramedic techniques.

The Fire Department obtained a Standards of Cover Assessment in 2015 which contains adopted written policies and procedures that determine the distribution, concentration and reliability of fixed and mobile response forces for fire, emergency medical services, hazardous materials and other technical responses and seeks to implement short and long-term steps identified in the plan to maintain optimal services to the City.

Training

Members of the Fire Department are trained in Urban Search and Rescue (US&R). As part of the Orange County Task Force 5 US&R Team, one of 28 operational FEMA US&R teams in the United States, US&R team members provide trained urban rescue teams for regional and national emergencies. The Department also has a Swift Water Rescue Team that deploys rescue equipment during flood hazards. In addition to training for more common hazards, firefighters also train to handle incidents involving weapons of mass destruction, learning procedures for identification, decontamination, evacuation, and shelter-in-place.

National Fire Protection Association (NFPA) standards are guidelines or “best practices” that the Fire Department strives to meet. NFPA standards state that the fire department shall have a training program and policy that ensure that members are trained and competency is maintained to execute all of its responsibilities. The Orange City Fire Department’s training program provides for emergency service training to its staff members primarily through regionally offered classes. Common classes are Terrorism Liaison Officer, WebEOC, AlertOC, and EOC classes.

The Orange City Fire Department complies with Emergency Medical Services Authority (EMSA) standards by certifying all suppression personnel with CPR, Emergency Medical Technician, and Paramedic certifications and licensures. All three of these programs are administered on an on-going basis to ensure Fire Department staff remains current. Orange maintains Emergency Medical Transport program compliance with the local EMSA (LEMSA) office (Orange County Health Care Agency).

The Joint Apprenticeship Committee is a joint effort funded by the California State Fire Marshal’s Office, and the California Professional Firefighters Association. It provides funding for each hour of training provided to apprentices in the fire service. These funds can be used



to improve the quality of education and training in the fire service. The RT-130 wildland firefighting training is refresher training supported by The National Wildfire Coordinating Group. RT-130 classes are offered annually and are mandatory for all personnel to be eligible to respond out of County for wildfire incidents. The Orange City Fire Department provides RT-130 training each year and tracks attendance for full compliance.

Fire Prevention

The Fire Department engages in fire prevention via public education, preplanning project review of new construction, annual inspections of facilities with potential hazards, inspecting for State Fire Clearances, and inspecting fuel modification/weed abatement.

Public Education

Public education provides members of the community with tools to increase the level of safety in their homes and workplaces by preventing fire and other emergencies. It also equips them to minimize injury and property loss in the event that an emergency does occur. The Fire Department provides public education by request, using personnel as available. The City does not currently have any Firewise communities but is available to support and assist any future efforts by interested neighborhoods.

New Construction

The Fire Department is actively involved with new development and redevelopment in the City. The Fire Plans Examiner meets with developers early on in the project planning phase, attends internal project review meetings, and coordinates plan review with contract plan reviewers on an as-needed basis. Plans are reviewed for compliance with the California Fire Code, City Fire Master Plan Guidelines, defensible space requirements in the VHFHSZ, emergency responder access, water supply, and water pressure/fire flow. The New Construction Inspector witnesses on-site testing and installation of fire protection systems, and confirms that construction conforms to approved plans.

Annual Inspections

All businesses with fire permits receive annual inspections. Moderate-hazard, non-permitted businesses receive field inspections once every three years. The Office of the State Fire Marshal requires annual inspections for apartments and high-rise buildings. Many of the Fire Department's occupancy inspections are conducted by the Operations Division (firefighting personnel). However, the Prevention Division conducts inspections in multi-family dwellings, high-rise structures, institutional and hazardous occupancies, as well as other locations selected for their complexity.

State Fire Clearances

The State of California licenses various educational, institutional, and residential facilities, such as family day care homes, nursing homes, and residential care facilities for the elderly. As part of the licensing requirements, the Fire Department is responsible for issuing fire clearances after all State fire and life safety requirements have been met.



Fuel Modification and Weed Abatement

Wildfire is an ever-present threat in the eastern and northern portions of the planning area. This threat is managed by proactive fuel modification and weed abatement. Fuel modification is the progressive thinning and irrigation of selected vegetation to form increasingly fire resistant vegetation as brush fires approach buildings. It is required for all developments bordering the wildland-urban interface. Compliance with weed abatement standards provides defensible space between structures and dead brush, grasses, and other vegetation. Weed abatement inspections for required clearance are performed twice a year for all vacant City-owned and private lots. Private property owners and homeowners' associations are responsible for the continual maintenance of fuel modification installations and biannual weed abatement. The City utilizes the Vegetation Management Guideline - Technical Design for New Construction, Fuel Modification Plans, and Maintenance Program to accomplish fuel modification, weed abatement, and defensible space necessary in new development. Furthermore, Fire Department staff enforce defensible space requirements in the VHFHSZ and require adherence to development restrictions and maintenance requirements in the VHFHSZ.

Police Services

The Orange Police Department responds to emergency situations and patrols neighborhoods and commercial areas within the City to promote a safe environment. The staff maintains official criminal records, investigates crime, and, in an emergency, assesses situations and quickly dispatches appropriate emergency responses. The Police Department also directs proactive crime prevention programs. The Department's headquarters is located on North Batavia Street and includes the City's Emergency Operation Center. The Department operates a substation at the Outlets of Orange.

To maintain the City's ability to serve current residents and businesses, applicants will be required to provide for adequate services and equipment to serve residents and businesses of new developments. Land uses will be evaluated and modified, if necessary, to facilitate access to emergency services, meet service standards, and ensure land use compatibility.

Orange's partnerships with other public agencies and businesses will also improve its emergency services. For example, the City receives fire and emergency medical dispatch services from the Metro Cities Fire Authority Communications Center that serves six other cities in the County. The City participates in the Standardized Emergency Management System (SEMS) for mutual aid and communication with other agencies during regional emergencies. Coordination with other cities and regions, and with State and federal agencies, will help address hazards both within and beyond the City's jurisdiction.

Crime Prevention

Reducing crime in the City enhances the living and business environment. A low crime rate attracts new businesses and gives residents a greater sense of security and community pride.



Public Outreach and Education

The Police Department works with the community to promote safety by increasing awareness of personal and property crime risks. Crime prevention also involves educating the public about personal safety, business and neighborhood watch programs, and residential and business security. The Police Department connects with the community using social medial platforms including Facebook, Instagram, and Twitter.

The Police Department facilitates a Business Watch program that teaches business owners and employees crime prevention techniques and strategies they can use to help cut down on business-related crime. Training is conducted at a business complex with managers, owners, and employees to help maximize attendance. The goal of the Business Watch program is to teach businesses how not to become a target for crime. If businesses do not take a proactive approach, crime can gradually develop and affect the business environment.

The Police Department provides a Citizen’s Academy. The program allows the opportunity for the community to learn generally about police functions and to get to know Police Department personnel.

The Police Department’s Crime Prevention Bureau coordinates Neighborhood Watch programs that emphasize the importance and effectiveness of crime reporting by neighbors. Neighborhood Watch allows neighbors to report suspicious behavior or incidents to the Police Department. The program encourages neighbors to get to know one another and keep an eye on their community, enabling the City to increase security for its residents. The program also provides public awareness and prevention seminars.

The Crime Prevention Bureau also offers several additional free crime prevention programs to the community, including security inspections of homes and businesses within the City, and electronic engraving for personal items and vehicles through the *Operation Identification* program. Educational presentations to community, business, and neighborhood groups are also available on topics such as child safety, identity theft prevention, personal safety, burglary prevention, and senior safety.

The City strongly supports these outreach and education activities, and the Police Department will continue to support community programs and neighborhood-level efforts toward crime prevention and education.

Crime Prevention Through Environmental Design

Orange values environmental design as a tool to help prevent crime. The concepts of CPTED offer non-invasive and permanent measures to prevent crime in the City. CPTED includes the following five concepts: territoriality, natural surveillance, activity support, access control, and maintenance.

- **Territoriality:** Demarcating the boundary of a property or an area through walls and fences can discourage intrusion. 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, and high quality landscaping express pride in ownership and identify personal space.



- **Natural Surveillance:** Arranging populated functions or rooms in homes and businesses to face the street allows easy surveillance by residents and employees. Crime is discouraged through the design and orientation of buildings and public spaces, along with placement of physical features, activity centers, and people in ways that maximize the ability of others to see what’s going on. Conversely, barriers such as bushes, sheds, or shadows make it difficult to observe activity. Windows or doors oriented to streets and public areas, in conjunction with 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.
- **Access Control:** Circulation, site, and building access can be controlled through designating paths and placing bollards or fences to limit access.
- **Activity Support:** Supporting activities on the street attracts people and encourages natural surveillance. Encouraging legitimate activity in public spaces assists in discouraging crime. Improvements such as 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. Providing a mix of land uses, types of residential development, and public or quasi-public spaces encourages diverse households and patterns of activity, increasing security due to round-the-clock activity and more eyes on the street.
- **Maintenance:** Maintenance of sidewalks, street trees, lighting, and private property discourages negative behavior such as littering and vandalism.

Crime Prevention Through Environmental Design (CPTED) concepts enable developers and designers to incorporate crime prevention measures into building design. Territoriality can be achieved by demarcating boundaries with various surface treatments and careful design to make intrusion and suspicious activities easy to identify. Building orientations that face the street, window placements and size, and provision of lighting allow neighbors to survey their neighborhood and discourage intrusion. Pathways and obstructions such as walls and gates allow property owners and the City to control access.

Crime prevention also requires public participation. The City’s Neighborhood Watch Program relies on Orange neighbors as its most effective crime prevention tool. The program provides training to volunteers who maintain neighborhood safety by being watchful and reporting suspicious behavior in their area.

Crime prevention relies upon programs implemented by government agencies. To reduce crime, the City will emphasize the need for well-lighted community areas and the use of extra surveillance in areas susceptible to high crime rates, such as parking lots. Complementary uses within mixed-use areas will be encouraged to reduce crime. Activity support is strengthened by intentionally placing programs and activities in areas that improve the perception of safety and discourage potential offenders.

The success of CPTED depends on maintenance of all these programs. Maintaining streets, lighting, and landscaping facilitate natural surveillance and access control. Maintaining private and public properties requires participation from property owners and City departments.



Continuation and monitoring of CPTED programs will promote safety in Orange neighborhoods.

Disaster and Emergency Preparedness

Being prepared and knowing what courses of action to take in case of emergencies reduces the chance of injury and damage. Educating staff and the public regarding hazards prepares them mentally and physically, leading to quick and appropriate response. The City will initiate and support practices of emergency evacuation measures at home, at work, and in schools to reduce the effects of emergencies on everyday life.

Emergency Operations Plan

In case of emergencies within Orange or originating from areas outside the municipal boundary, including foreign and domestic terrorist acts, the City will correspond with other jurisdictions, regions, and agencies to take appropriate actions. The City has an emergency plan which establishes emergency preparedness and emergency response procedures for both peacetime and wartime disasters. The plan is termed an “Emergency Operations Plan,” prepared in accordance with the State Office of Emergency Services guidelines for multi-hazard functional planning.

The plan consists of three parts: 1) a basic plan; 2) annexes which address specific functions and duties of response agencies; and 3) a directory of emergency response resources. Rather than focusing on specific responses for specific hazards, as contingency plans have done in the past, the City’s plan concentrates on specific agency response for any type of disaster. For example, in the event of an earthquake, flood, or industrial accident, the Orange Fire Department is responsible for fire suppression, emergency medical care, and rescue operations.

The various annexes in the City’s Emergency Operations Plan outline emergency responsibilities by type of operation, such as “Fire and Rescue” or “Care and Shelter.” Table PS-2 summarizes emergency operation responsibilities of various City departments.



**Table PS-2
Emergency Operations Responsibilities**

	Alerting and Warning	Communications	Situation Analysis	Management	Public Information	Radiological	Fire and Rescue	Assess Control	Law Enforcement	Medical	Public Health	Coroner	Care and Shelter	Movement	Rescue	Const. and	Supply/Procurement	Personnel	Transportation	Utilities	
City Departments																					
Police	■	■	■	■	■			■	■			■		■	■						
Fire	■	■	■	■	■	■	■			■					■	■					
Public Works	■	■	■	■				■			■				■	■			■	■	■
Community Services													■	■					■	■	
Community Development			■		■											■					
Finance				■													■				
Human Resources																		■			
Library					■								■						■		
City Attorney				■																	
City Clerk					■																
City Manager				■	■																
Outside Agencies																					
County Health											■										
Red Cross													■								
Notes:	■ Supporting Agency/Organization ■ Principal Agency/Organization																				

In support of Disaster and Emergency Preparedness, the Police Department provides a Community Emergency Response Team (CERT) program to support emergency awareness and preparedness for the Orange community.

Emergency Access and Evacuation

All City arterials are recognized as primary emergency response routes. In addition, non-arterials can be secondary emergency response routes. The City’s Residential Neighborhood Traffic Management Program, which identifies traffic management and traffic calming tools, specifies that emergency vehicle access shall be accommodated consistent with response standards with implementation of appropriate traffic management measures. Additionally, if current emergency vehicle access does not meet existing response standards, traffic calming efforts should not further degrade response times.

The City ensures that all new or substantially remodeled development or right-of-way improvements provide for emergency access and evacuation based on compliance with the most recent California Fire Code, California Building Codes, Fire Master Plan requirements, and



the City’s development review process. However, there are existing residential developments within the Very High Fire Hazard Safety Zone (VHFHSZ) that do not have at least two evacuation routes. These developments are located as shown on Figure PS-6a and PS-6b. The City already applies strict target-hardening codes to construction and redevelopment in this area and will look to implement any additional evacuation routes for the area as opportunities arise.

The City’s Emergency Operations Plan utilizes evacuation routes for emergency situations and Fire Evacuation Area Maps are provided for public use on the Police Department’s website. The City’s Wildland Urban Interface pre-plans also identify potential choke points/entrapment areas, safety zones, and a primary evacuation plan. The routes of escape from disaster-stricken areas will depend on the scale and scope of the disaster. For example, a flood occurring along the Santa Ana River would require evacuation of the City’s industrial area east toward the Costa Mesa (SR 55) Freeway. However, if a large fire occurred in the eastern portion of the industrial district, employees would evacuate to the west, toward the Santa Ana River.

Figure PS-7 provides a generalized version of the City’s evacuation corridors. Although emergency egress may vary depending on the type and scale of emergencies, it will most often take place on Chapman Avenue, Katella Avenue, Glassell Street, Lincoln Avenue, Orangewood Avenue, and Hewes Street. Most of these streets are wide, arterial roads with capacity to efficiently move residents in and out of the City. The City will continue to evaluate the viability of each of these routes to serve as evacuation corridors.

Figure PS-8 provides greater-detailed evacuation corridors for wildfire events in the easterly portions of the City that abut very high fire hazard severity zones. The City of Orange Police Department website hosts a “Know Your Way” in an emergency webpage with a prominent link to the evacuation routes and each color-coded neighborhood has a magnified evacuation route map.

Standardized Emergency Management and Mutual Aid Assistance

Standard Emergency Management System (SEMS) and National Incident Management System (NIMS) are used by the City to provide a standardized approach to emergency management across all jurisdictions and disciplines. Both systems use common terminology and organizational structure to allow incident coordination, regardless of local, State, or federal government agency participation. Mutual Aid agreements (both local and master) provide for rapid sharing of resources during emergencies. Based on the principle that no single agency has enough resources to handle all potential emergencies by themselves, a cooperative sharing of resources across districts and jurisdictional boundaries does. Local Mutual Aid agreements allow for rapid sharing of nearby resources from other agencies. Master Mutual Aid agreements provide sharing of resources from more distant jurisdictions.

The City participates in the SOLAR Plan, an agreement between the San Bernardino, Orange, Los Angeles, and Riverside County fire agencies to provide for common radio communications and coordinated response.



Emergency Shelters

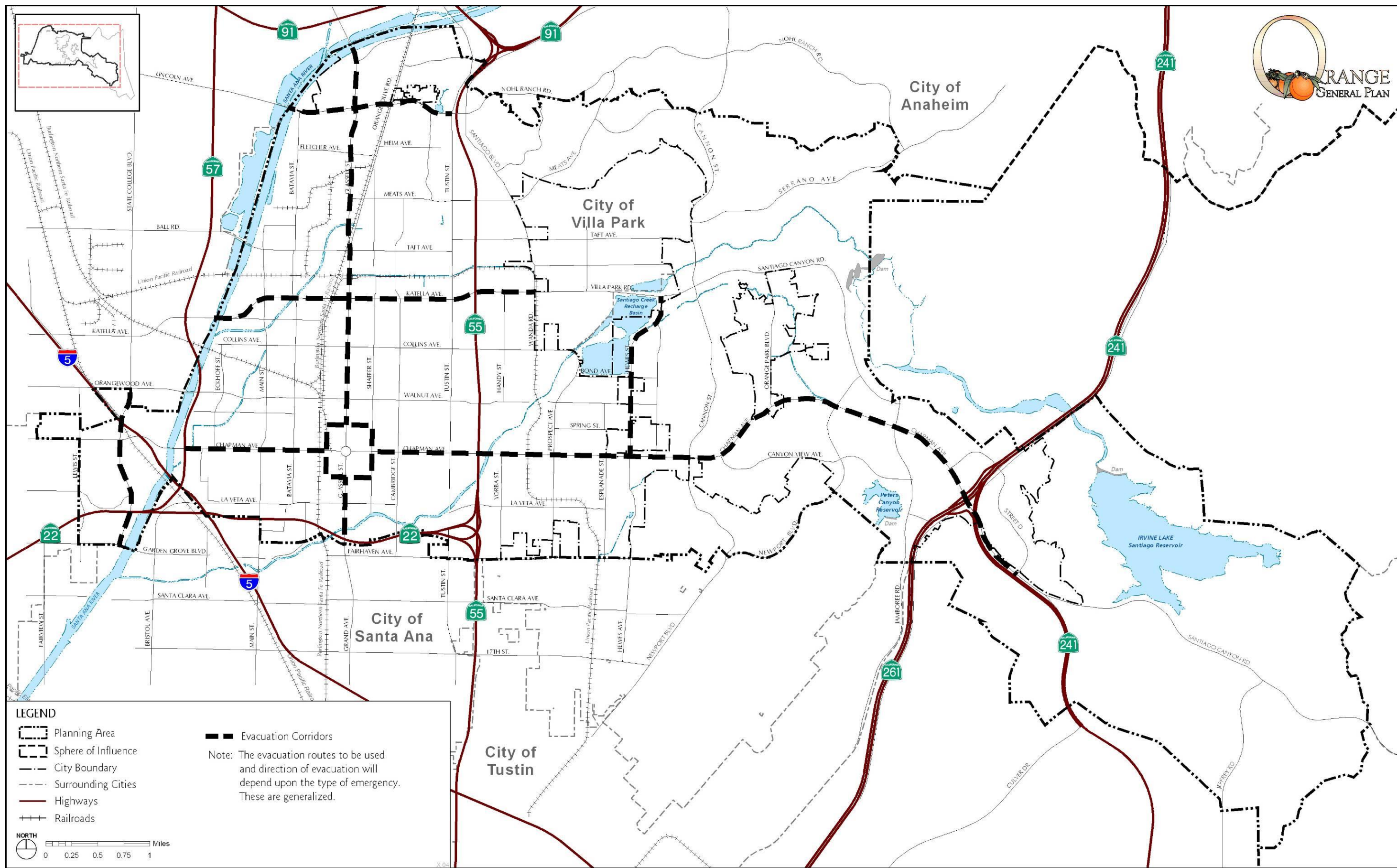
In the event of either a natural or human-caused disaster, homes may be destroyed or be inaccessible for extended periods of time. Orange residents will require some form of temporary shelter. As Table PS-2 indicates, the Red Cross bears primary responsibility for providing emergency shelter to displaced residents. The Red Cross maintains a list of emergency shelters within and immediately adjacent to the planning area. Most of these emergency shelters, listed in Table PS-3, are public or private schools. The Wildland Urban Interface pre-plan temporary evacuation assembly points are consistent with Table PS-3.

Table PS-3 Emergency Shelters/Assembly Points	
Primary Sites	
El Modena High School	3920 Spring, Orange
Orange High School	525 N. Shaffer, Orange
Villa Park High School	10842 Taft, Villa Park
McPherson Middle School	333 S. Prospect, Orange
Peralta Middle School	2190 Canal, Orange
Santiago Middle School	515 N. Rancho Santiago, Orange
Yorba Middle School	935 N. Cambridge, Orange
Cerro Villa Middle School	17852 Serrano, Villa Park
The Outlets at Orange Shopping Center	20 City Blvd W
Secondary Sites	
All Elementary Schools	City-wide








Homeland Security

In the aftermath of the terrorist attacks on September 11, 2001, the City of Orange’s emergency preparedness and response services have become an even more critical function. Since the events of 9/11, a considerable amount of information has been generated on potential vulnerabilities, protective measures, and anti-terrorism and security technologies. The Police and Fire Departments recognize the need not only to learn from the lessons of 9/11, but also to collectively address the anti-terrorism planning and policy issues that most affect Orange residents. The goals, policies, and implementation programs associated with emergency preparedness also apply to readiness and response to terrorist acts.

The Police Department also offers education presentations to the community, City Staff, businesses, schools, and neighborhood groups on topics such as active killer or shooter.



LEGEND

-  Planning Area
-  Sphere of Influence
-  City Boundary
-  Surrounding Cities
-  Highways
-  Railroads
-  Evacuation Corridors

Note: The evacuation routes to be used and direction of evacuation will depend upon the type of emergency. These are generalized.

NORTH

0 0.25 0.5 0.75 1 Miles

Figure PS-7. Generalized Evacuation Corridors
RPC 2 (b)(iii)

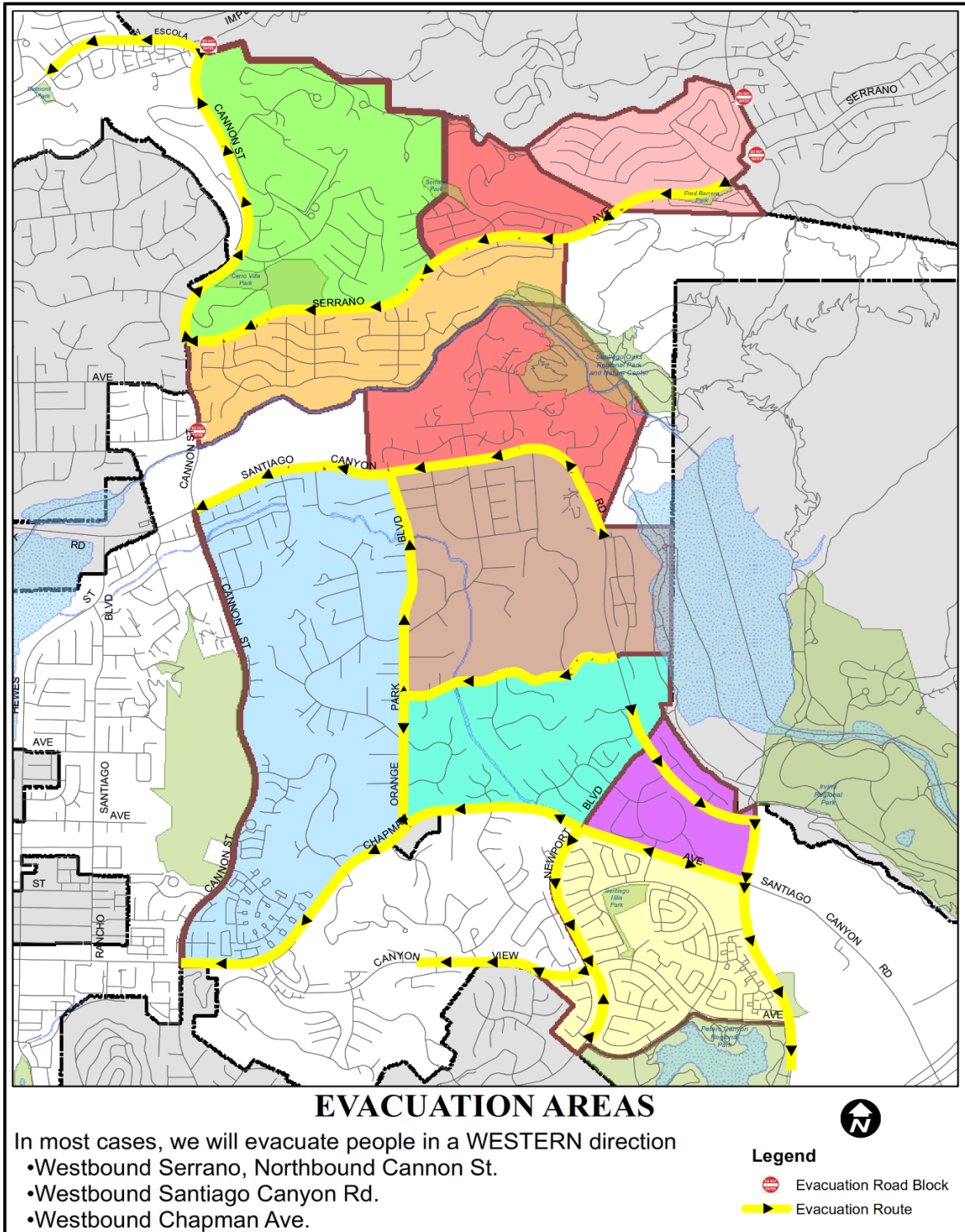


Figure PS-8. Fire Evacuation Area Map



Pedestrian and Bicycle Safety

Providing a safe environment for pedestrians and bicyclists means designing streets that can carry vehicles, but that are also scaled for pedestrians and cyclists. Furnishing streets with bike racks, benches, lighting, and landscaping; repairing missing or dangerous sidewalks; and designating bike paths are all techniques the City can employ to reduce pedestrian and bicycle accidents. A desirable pedestrian and bicycle environment also requires circulation improvements such as placing clear signs for cyclists and pedestrians, and providing buffers and traffic calming to tame automobile traffic around pedestrians and cyclists.

Implementation of the City's goals and policies for pedestrian and bicycle safety will require an assessment of existing streets and of the City's ability to expand or add improvements to accommodate the needs of pedestrians and cyclists in addition to automobiles. These policies are closely related to Circulation & Mobility Element policies that encourage vehicle safety. The City will also pay special attention to high-risk areas such as parking lots and areas surrounding schools and recreational facilities.

PUBLIC SAFETY IMPLEMENTATION

The goals, policies, and plans identified in this Element are implemented through a variety of City plans, ordinances, development requirements, capital improvements, and ongoing collaboration with regional agencies and neighboring jurisdictions. Specific implementation measures for this Element are contained in the General Plan Appendix.



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