

VI. SEISMIC AND SAFETY

INTRODUCTION AND BACKGROUND

General Plan Legislation

In 1970, the State made the Seismic and Safety Element a mandatory element of the General Plan. The provision for a Safety Element was partly a reaction to damaging wildfires that occurred in September and October of 1970. Following the San Fernando Earthquake in 1971, the State Legislature enacted legislation requiring counties and cities to adopt a Seismic Safety Element as part of the comprehensive General Plan. In 1984, there were revisions in General Plan legislation pertaining to these two elements. The Seismic Safety and Safety Elements were combined into a single element that contained essentially the same information previously included in the two elements.

According to §65302(g) of the Government Code, the Safety Element is described in the following terms:

A Safety Element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geological hazards known to the legislative body; flooding; and wildland and urban fires. The Safety Element shall include mapping of known seismic and other geologic hazards. It shall also address evacuation routes, peak load water supply requirements, and minimum road widths and clearances around structures, as those items relate to identified fire and geologic hazards.

Purpose and Function

The purpose of the element is to identify hazards within Villa Park and initiate precautions to protect the safety of the community. The Element is principally a preventative planning document that will reduce natural and manmade hazards to acceptable levels of risk.

Relationship to Other General Plan Elements

Some community safety concerns overlap or are associated with the issues considered by the Open Space and Land Use Elements. According to Government Code §65590(b)(4), the Seismic and Safety Element is linked to the implementation of a local open space plan. For instance, as a means of protecting public health and safety, open space land may be set aside for these purposes in circumstances that need special regulation and management. Undeveloped land devoted to open space use may include area set aside because of hazardous conditions such as earthquake fault zones, unstable soil areas and flood plains. In addition, a community's Land Use Element usually

incorporates the findings and recommendations relative to public safety and open space lands.

INVENTORY OF EXISTING CONDITIONS

Geologic and Seismic Hazards

Orange County, situated on the California south coastal plain, covers an area of 782 square miles. It is bounded by Los Angeles and San Bernardino Counties to the north, Riverside County to the East, San Diego County to the south, and the Pacific Ocean to the west. Folding and faulting of the earth's crust during the Tertiary Period produced topographic features visible today. The western portion of the County is a series of broad sloping plains (Downey and Tustin Plains) formed from alluvium transported from the mountains by the Santa Ana River, Santiago Creek and other local streams. The Puente/Chino Hills, which identify the northern limit of the valley, extend for 22 miles and reach a peak height of 1,780 feet. To the east and southeast of the valley are the Santa Ana Mountains, which have a peak height of 5,961 feet. North of the City of Villa Park are the Peralta Hills, exceeding a height of 1,500 feet. To the south is the Lomas de Santiago ridgeline with elevations as high as 1,700 feet.

The City of Villa Park is located in the low foothills on the west flank of the Santa Ana Mountains, and is southeast of the Santa Ana River. Within its southeastern boundary runs a portion of Santiago Creek. The majority of the community is located in older sedimentary rock overlaid with alluvial material deposited by the Santa Ana River and Santiago Creek. The eastern portion of the community consists of volcanic rock deposited in the late Miocene time.

The El Modena and Peralta Hills Faults are nearest to Villa Park. Both are smaller north-northwest trending reverse faults located in the west flank of the Santa Ana Mountains, about two miles northeast of the El Modena Community. The El Modena and Peralta Hills faults are approximately 6 miles in length. Little impact is anticipated from these faults. With no recent record of activity, prevailing scientific thought is that neither is anticipated to be capable of generating significant earthquakes.

There are several other faults that could potentially affect Villa Park. The fault systems are listed below and shown in **Table VI-1**.

**Table VI-1
Local Faults**

Fault	Approximate Distance From Villa Park
Whittier	8.5 miles N.E.
Los Alamitos	10 miles S.E.
Chino	11 miles N.E.
San Jose	13 miles N
Newport/Inglewood	14.0 miles S.E.
Sierra Madre	23 miles N
Red Hills	25 miles N.E.
San Jacinto/Coyote Creek	34.0 miles N.E.
San Andreas	38.0 miles N.W.
San Fernando	52 miles N.W.

Most of the loss of life, injuries, and damages that occur during an earthquake are related to the collapse of hazardous buildings or structures. Villa Park continues to apply the most recent Building Codes that in turn assist in reducing hazards from earthquakes.

Slope Stability

Slope stability in the area is affected by three interrelated factors. These include surface and subsurface water, geologic structure and rock types, and the degree of slope. Water moving over or under the land surface erodes, steepens, and undercuts slopes, thus removing lateral support. Much of the City’s surface flows are directed to subsurface stormdrain infrastructure. Stability is also dependent on the specific properties and combination of materials forming the slope. Moderate slopes occur in the northeastern portion of the City. Exposure to such hazards can be increased with the urbanization of hilly areas. Development densities in this area are low and grading plans were required to address slope and surface water issues. Finally, extensive landscaping assists in the reduction of surface erosion.

Erosion

Land erosion is a natural process by which soil is removed from one area and transported to other areas largely by means of wind, gravity, and moving water. If water moves over level areas, little physical damage occurs to structures. However, if the flow of water is constricted or the slope is steepened, the velocity increases and deep gullies may result. Accelerated erosion within an urbanized area can cause damage by undermining structures, depositing silt, sand, or mud in roads and streets, and blocking storm sewers. In Villa Park this threat has been greatly reduced through code based development, landscape requirements, and storm drain infrastructure improvements.

Flooding

Hazards associated with flooding can result from two sources. The first potential source of flooding would be a natural occurring weather event and the second would be the result of a failure at a water storage facility such as a water storage tank or dam. Locally there is one in-ground storage facility with no threat to the City. Those in the surrounding area have little to no potential impact to the City based on the direction of flow and drainage improvements.

The City's participation in the National Flood Insurance Program (NFIP), a component of the Federal Emergency Management Agency (FEMA), has mitigated the potential for flood hazards in new development/substantial improvement construction by requiring corrective and preventative measures. These measures take a variety of forms and generally include requirements for zoning, subdivision or building, and special-purpose floodplain ordinances.

The City of Villa Park has areas designated as one-hundred and five-hundred year storm risk areas, which are the maximum levels of water expected to occur after the inundation of an area (exhibits detailing these areas are available at City Hall). Mitigation measures implemented by City Ordinance require all new construction or substantial improvement within the Flood Zone AO (AO – 100-yr Special Flood Hazard) Area to have a finished floor elevation constructed one foot above the hundred-year storm level. Additionally, the City continues to make improvements to its storm water collection system, thereby removing surface flows and channeling water to nearby basins.

Fire Hazards

Fire hazards are the likelihood of an area burning and how it burns. In the past the most significant fire hazard was wildland exposure northeast of the City limits. Based on topography, fuel loading, and critical fire weather frequency (Santa Ana Winds), the area of the City adjacent to this exposure was considered a high risk fire hazard area. However, single-family residential development within the region has replaced that wildland area to the northeast and Villa Park is no longer listed as a Threat on the Federal Register's Communities at Risk List.

Risk from other types of fire hazards has also been reduced within the City. The age and condition of the majority of the existing housing stock, the type of construction, requiring roofing materials to have a minimum class "A" rating, and the absence of major industrial or commercial structures greatly reduce the risk of fire hazards. In the event of a fire, current emergency response providers state that services are provided 80% of the time within 7 minutes 20 seconds from receipt of call to on scene arrival. Villa Park also utilizes a highly successful core of volunteer fire fighters to supplement and support fire services.

Dam/Reservoir Inundation

Villa Park Reservoir, at an elevation of 581 feet, is an earthen reservoir located upstream from the City of Villa Park on Santiago Creek, was created for flood control purposes for water flow from Irvine Lake. Santiago Reservoir, at an elevation of 804 feet, creates Irvine Lake and functions as a reservoir for our area. It is an earthen reservoir that was built in 1933.

During years with heavy precipitation, release gates in Santiago Reservoir can be operated to prevent water from overflowing the face of the dam. Villa Park Reservoir then meters these heavy flows to prevent flooding of low lying areas downstream. Normally there is no water behind Villa Park Reservoir. Villa Park could be affected by failure at either of the reservoirs on Santiago Creek. However, these facilities are maintained and safety-inspected to ensure their integrity and that risks are minimized.

Hazardous Materials

Transportation of hazardous materials and flammable liquids along the arterial highways of Villa Park represents only a slight hazard as there are few users within the City and arterial transportation routes make up a very small portion of all transportation routes within the City. Truck limits and permit requirements limit use on any residential streets. There are no industrial developments within Villa Park and only one small commercial center that may attract such materials. Contract Police and Fire services have in place emergency response plans if a hazardous materials situation were to occur in Villa Park.

Climate Change

The scientific community has documented that increasing levels of greenhouse gases (GHGs) in the earth's atmosphere are contributing to rising global average temperatures. The most abundant GHG is carbon dioxide (CO₂), which is a by-product of fossil fuel combustion. CO₂ is removed from the atmosphere through sequestration by vegetation and dissolution into the ocean. Carbon sequestration is the absorption or removal from the air of carbon dioxide by plants or other natural processes. These sequestration processes happen naturally, but human-generated emissions have outpaced these removal processes, resulting in excessive GHG concentrations accumulating in the atmosphere, and leading to a subsequent trend of unnatural global warming.

Aircraft Traffic

The Orange County John Wayne Airport (JWA) is located 8.7 miles south of the City of Villa Park. As of 2008, over 950 planes (commercial aircraft and general aviation) fly in and out of JWA each day using a single runway. In June 2007, 395 were jet aircraft.

According to reports prepared for the John Wayne Airport, Villa Park does not lie within the “crash zones” of the airport. These areas surround the immediate landing and take-off zones. However, the concentration of small private aircraft in the vicinity increases the risk of mid-air collisions.

Military air traffic, air traffic associated with regional agencies and helicopter traffic in particular present safety hazards in terms of both noise and potential aircraft failure as flight patterns are often within the immediate vicinity of Villa Park and surrounding communities. Noise concerns are discussed in the noise element. The City monitors all developments regarding the expansion of John Wayne Airport and through City Council action, will respond accordingly to any change proposed.

The Community Emergency Response Team

The Community Emergency Response Team (CERT) program was developed in California in the mid-80s as a way to train people to better prepare for emergency situations in their communities. Since then, it has become a national model for helping people respond to emergencies. When emergencies happen, CERT members can give critical support to first responders and provide immediate assistance to victims. CERT members can also help with non-emergency projects that improve the safety of the community. The Villa Park CERT program is designed to augment the overall emergency response for the City. The Villa Park CERT team conducts periodic training, executes training drills, and helps educate the residents on safety preparedness items.

ISSUES AND OPPORTUNITIES

Issues

- Ground shaking may occur as a result of movement along any one of Southern California’s large regional faults such as the San Andreas, Newport-Inglewood, or Whittier-Elsinore. Movement along any of these fault zones has the potential to damage in Villa Park.
- Expansive soil conditions require specialized grading techniques or foundation treatment to control uplift characteristics of these materials. Settlement due to structural loading within areas underlain by compressible materials, such as thick topsoil, alluvium, and/or terrace deposits is a potential problem within the lower elevations of the community.
- The 2003 settlement agreements with John Wayne Airport regarding passenger limitations and curfews will expire respectively in 2015 and 2020.

- Scientific data indicates that global climate change is affecting natural process such as the water cycle and sequestration, which are resulting in depleted water supplies and increased CO₂ levels in the atmosphere.
- With the loss of El Toro as a potential site for a second airport in Orange County, John Wayne Airport will sustain the burden of being the single airport to meet the increasing demand for air transportation services.

Opportunities

- Villa Park is in the fortunate position that all of its structures are non-critical facilities having a relatively low profile, thereby reducing the probability of damage to life and property.
- The City maintains the most current development standards within its ordinances, codes, and requirements pertaining to the above mentioned hazards. Primary codes relating to this element are the Uniform Building Code, Uniform Fire Code, Fire Prevention Codes, Grading Ordinance, Zoning Ordinance, Subdivision Ordinance, and State Health and Safety Codes.
- The City's fire, police, public works department and emergency organizations are all well rated and take advantage of new methods, equipment, and techniques in the performance of their duties. The City maintains an active Community Emergency Response Team and emphasizes emergency preparedness.
- Local water storage is adequate in quantity and well located. Fire hydrant distribution meets or exceeds all applicable codes.
- The street circulation system is adequate to handle any necessary deployment of emergency vehicles and evacuation of residents.

GOALS, POLICIES AND PROGRAMS

Seismic and Safety Goal #1: Protect life and property from geologic hazards.

Seismic and Safety Policies:

S & S #1: Continue to coordinate with the State and agencies within the County to assist in the mitigation of geologic and seismic hazards.

S & S #2: Continue to participate in the Orange County Emergency Management Organization (OCEMO) and its program to maintain an Emergency Operating Center radio network.

Action Program:

1. Continue to implement the most current seismic requirements of the California Building Code with periodic updates.
2. Require geotechnical studies to be prepared for development projects located in areas containing known or suspected geologic hazards, consistent with the guidelines established by the State of California Division of Mines and Geology.

Seismic and Safety Goal #2: Protect life and property from the hazards of flooding.

Seismic and Safety Policies:

S & S #3: Enforce the requirements of the Federal Emergency Management Agency (FEMA) to mitigate flood hazards.

S & S #4: Support Orange County Flood Control District and Army Corp of Engineers efforts to monitor and upgrade regional and local flood control facilities.

S & S #5: Educate the public about flood related hazards.

Action Program:

3. Continue to require compliance with FEMA standards of flood proofing for substantial improvement projects located within the 100-year floodplain.

4. Make available flood hazard and response information to residents when requested and if applicable via electronic methods.

Seismic and Safety Goal #3: Protect life and property from water related hazards as a result of seismic rupture of dams/reservoirs.

Seismic and Safety Policies:

- S & S #6: Annually request and review California Department of Water Resources – Division of Safety of Dams (DSOD) inspection reports for both Villa Park and Santiago Reservoirs.
- S & S #7: Continue to prepare, review, revise, and update emergency response plans and programs between the City, dam/reservoir owners/operators, and Federal, State, and local agencies responsible for dam safety and disaster response.

Action Program:

5. Provide available emergency evacuation information to the public.

Seismic and Safety Goal #4: Protect life and property from fire.

Seismic and Safety Policies:

- S & S #8: Maintain adequate level of fire services.
- S & S #9: Maintain an Insurance Service Organization (ISO) rating of 3 or less.
- S & S #10: Continue to identify and evaluate new potential fire hazards, fire hazard areas, and fire prevention strategies and practices.
- S & S #11: Continue to adopt and honor agreements with adjacent communities for mutual automatic aid assistance.

Action Program:

6. Continue to implement the current requirements of the California Building Code related to fire protection in all construction.

7. Make available fire hazard safety information for resident and developers in electronic format.
8. Actively promote the installation of smoke detectors in all dwelling units.
9. Review the City's ability to reduce square footage requirements for fire sprinkler installation and retrofit.

Seismic and Safety Goal #5: Protect life and property from risks associated with the transportation of hazardous materials.

Seismic and Safety Policies:

S & S #12: Assess any risks involved in the transportation of hazardous materials within the City.

Action Program:

10. Support the efforts of the City's fire protection service provider to enforce State "right-to-know" laws.
11. Ensure travel routes through the City for vehicles transporting hazardous materials are clearly delineated.

Seismic and Safety Goal #6: Maintain an adequately manned police force and relevant crime prevention programs.

Seismic and Safety Policies:

S & S #13: Support neighborhood meetings and community programs on crime prevention and education.

Action Program:

12. Continue to implement "Neighborhood Watch" programs, involve the efforts of the City's police services provider, and encourage increased volunteer service in community watch programs.

Seismic and Safety Goal #7: The City will prepare for and adapt to the effects of climate change and promote practices that decrease the City's contribution to climate change.

Seismic and Safety Policies:

S & S #14: Evaluate the potential effects of climate change on the City's human and natural systems and prepare strategies that allow the City to appropriately respond and adapt.

Seismic and Safety Goal #8: The City will recognize and work to minimize safety impacts associated with the operation of John Wayne Airport.

Seismic and Safety Policies:

S & S #15: Participate in the Corridor City Coalition (Coalition) with the intent to protect the City from effects of air traffic utilizing John Wayne Airport.

Seismic and Safety Goal #9: The City will recognize and work to mitigate the safety hazards associated with civilian and military air traffic.

Seismic and Safety Policies:

S & S #16: Work with FAA, Orange County Airport officials and other agencies to establish aircraft corridors which minimize the exposure of Villa Park residents to air traffic related hazards.

S & S #17: Work with military and other government officials to minimize the impact of military helicopter and airplane traffic on Villa Park residents.