

ATTACHMENT 1: DRAFT PUBLIC SAFETY ELEMENT

THE PLEASANTON GENERAL PLAN

V. PUBLIC SAFETY ELEMENT

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V. PUBLIC SAFETY ELEMENT

PURPOSE

The purpose of the Public Safety Element is to provide information, policies, and programs directed toward reducing the potential for human injury and loss of life, and to minimize property damage and economic and social disruption due to natural and man-made hazards.

RISKS OF HAZARDS¹

All urban areas in California are subject to a variety of naturally-occurring hazards as well as hazards caused by human activities. **Risks** to life and property within the Planning Area are most commonly posed by geology (earthquakes, landslides, etc.), fire, flood, aviation, train and auto accidents, and the accidental discharge of hazardous materials. None of these hazards can be avoided entirely or mitigated completely. However, potentially devastating impacts presented by such hazards can be reduced through the recognition of the safety risks and the application of safety standards designed to protect life and property to the greatest feasible extent.

The Public Safety Element contains policies and programs which establish "**safety**" criteria for evaluating new developments and which establish standards for the City's emergency response services and programs to protect life and property.

GEOLOGIC HAZARDS

Geologic Setting

The Pleasanton Planning Area is located within the Amador Valley, which is part of the **Coast Range** geologic province of California.

The Coast Range province is a large area of folded and faulted rocks situated along the western edge of the North American continent. The **Amador Valley** is a depression in this rock formation which joins the San Ramon Valley to the north with the Livermore Valley to the east. The geologic conditions which have formed the topography surrounding Pleasanton are the result of a global pattern of moving **continental plates** which have shaped the earth's outer surface over hundreds of millions of years.

The underlying geology of sedimentary rock in the Pleasanton Ridge and the Southeast Hills, the thick deposits of unconsolidated sediment on the Valley floor, and areas of older landslide deposits are factors which, along with the proximity of several earthquake faults, create a geologic setting susceptible to a number of **geologic hazards**. These hazards are described briefly below.

The potential extent and severity of any geologic hazard varies throughout the Planning Area depending upon the underlying geology, topography, soil type, groundwater table, and seismicity. Certain portions of the Planning Area are more at risk to particular geologic hazards than others, and the geologic characteristics of a specific area will result in

different responses to seismic activity.

Seismic/Earthquake Setting

As is the case for most of California, people and property in Pleasanton are subject to risks from seismic activity. According to the U.S. Geological Survey (USGS) Workgroup on California Earthquake Probabilities, there is a 62 percent probability of at least one magnitude 6.7 or greater quake, capable of causing widespread damage, striking the San Francisco Bay Area region before 2032 (USGS, April 2004). See Figure X for a San Francisco Bay Region Earthquake Probability Map.

The active faults in or near the Pleasanton area include the Calaveras, Concord-Green Valley, Green Valley, Greenville, Hayward, Mt. Diablo Thrust Fault, and San Andreas Faults. In Figure X, the USGS Workgroup has estimated for each fault line the probability it is capable of generating a 6.7 magnitude earthquake during the period 2003 to 2032.

Earthquake magnitude is a measure of overall earthquake size at the epicenter, and is recorded by the **Richter Scale** (Table V-1), a logarithmic scale related to seismograph readings. In addition, seismologists use "**moment magnitude**" to measure the amount of energy released by an earthquake. The moment magnitude is proportional to the area of the fault plane that has slipped and thus is directly related to the fault length. An earthquake may have one moment magnitude but a range of intensities. "Intensity" is a measure of the effect of an earthquake at a specific location. The most commonly used measurement of earthquake intensity and ground-shaking is the **Modified Mercalli Intensity Scale**. Table V-1 summarizes the Modified Mercalli Intensity Scale (MMI) in

relation to the Richter Scale.

Almost all of the major faults in the Bay Area are **strike-slip faults** where the rupture along the fault plane extends almost vertically into the ground, and the ground on one side moves past the ground on the other side. In some earthquakes, the surface of the ground can rupture along the fault, or a landslide can be triggered, or a number of other incidents may occur. But in all earthquakes the ground shakes, and most earthquake damage is caused by the shaking of the ground itself.²

Earthquakes can cause a series of specific hazards, such as:

1. Ground Shaking

Portions of the Planning Area which are underlain by loosely compacted soils may experience the greatest amount of **ground-shaking** and damage, even though they may not be closest to the fault rupture.

According to Figure V-2, the ground shaking hazard in the Pleasanton Planning Area is mostly very high, with a moderate shaking hazard in some areas. The intensity of earthquake ground shaking in any one area varies for a number of reasons: the magnitude of the earthquake; the distance from the site of the fault source; the direction of propagation of the rupture; and the type of geologic materials underlying the site, with stronger shaking occurring on the softer soils.

2 Landslides

Landslides could occur generally in areas shown in Figure V-3, as a result of groundshaking. Landsliding is a natural process of relatively rapid downslope

movement of soil, rock and rock debris as a mass. The rate of landsliding is affected by the type and extent of vegetation, the slope angle, the degree of water saturation, the strength of the rocks, and the mass and thickness of the deposit. Some of the natural causes of this instability are earthquakes, weak materials, stream and coastal erosion, and heavy rainfall. In addition, certain human activities tend to make the earth materials less stable and increase the chances of ground failure. Activities contributing to instability include extensive irrigation, poor drainage or ground-water withdrawal, removal of stabilizing vegetation and over steepening of slopes by undercutting them or overloading them with artificial fill. These causes of failure, which normally produce landslides and differential settlement are augmented during earthquakes by strong ground motion.

In the Pleasanton Planning area, 850 urban acres are in mostly existing landslide areas (ABAG, 2002).

An earthquake occurring in conjunction with a season of heavy rainfall when soils are saturated with water would create the most severe danger of landslides.

3. Lateral spreading

Lateral spreading could occur along the arroyos where surface materials consist of young alluvial and fluvial deposits. An occurrence of lateral spreading due to seismic activity is also most likely in conjunction with heavy rainfall.

4. Liquefaction

In the City of Pleasanton, 6,533 urban acres are in areas of moderate, high or very high liquefaction susceptibility according to the Association of Bay Area Governments (ABAG) (see Figure X for a detailed liquefaction susceptibility map for Pleasanton.)

Liquefaction is a specialized form of ground failure caused by earthquake ground motion. It is a "quicksand" condition, occurring in water-saturated, unconsolidated, and relatively clay-free sands and silts caused by hydraulic pressure (from ground motion) forcing apart soil particles, and forcing those into quicksand-like liquid suspension. In the process, ground materials that are normally firm but wet take on the characteristics of liquids. The potential for liquefaction depends on soil conditions and groundwater levels, which may fluctuate. Susceptibility to this hazard is greatest when ground water tables are high.

Other seismic hazards with less potential impact on the Planning Area include surface faulting, lurch cracks, rock falls, differential settlement, and seiches. Table V-3 and Figure V-4 show the estimated level of impact based on the various seismic hazards. Catastrophic events, such as failure of the **Del Valle Reservoir Dam** and subsequent flooding of the Pleasanton Planning Area, is considered to have an extremely low potential for occurrence.

Earthquake Fault Zones

The **Alquist-Priolo Hazards Act** passed by the State legislature in 1972 (renamed the "Alquist-Priolo Earthquake Fault Zoning Act" in 1993) established earthquake fault zones along faults considered by the State Division of Mines and Geology to be active or potentially active. An active fault is considered one which has experienced surface displacement within the last 11,000 years, while a potentially active fault is a fault which has moved during the past two to three million

years but not proven to have moved within the past 11,000 years. The earthquake fault zone extends for 500 feet in width on either side of an identified fault trace of major active faults and about 200 to 300 feet in width on either side of a minor active fault, as designated by the State. Development of a building for human occupancy is generally restricted within 50 feet of an identified fault. The Calaveras and Verona Faults are the only faults within the Planning Area currently designated as Alquist-Priolo Earthquake Fault Zones by the State (Figure V-3).

When construction of a building for human occupancy is proposed within an earthquake fault zone, a geotechnical investigation (Geologic Report) is required and must be submitted to the City for review. This study, prepared by a registered geotechnical engineer, presents conclusions regarding the location and existence (or absence) of active faults at the site and also contains recommendations for determining building setback distances from the identified faults. The City's **consulting geologist** reviews the reports for acceptability.

Impact Projections and Mitigations

It is not possible to predict with accuracy the **extent of damage** in the event of a significant earthquake. However, some types of damage can be generally expected. In **residential** areas, chimneys, porches, and stucco may be damaged by moderate shaking during a quake. Structures not properly fixed to foundations may slip from them. In **commercial and industrial** areas, a severe earthquake can lead to significant damage or collapse of unreinforced masonry buildings. The City has completed a program for seismic retrofitting of unreinforced masonry buildings to address this problem.

The **California Uniform Building Code (CBC)** requires that structures be designed and built to withstand groundshaking during earthquakes. The CBC frequently is updated as new information is available through continued research and experience. The City regularly adopts and enforces revised versions of building and fire codes. In general, the performance objectives set for structures under the CBC are: (1) resist minor earthquakes without damage; (2) resist moderate earthquakes without structural damage, non-structural damage may occur; and (3) resist major earthquakes without collapse, some structural damage may occur.

Secondary impacts caused by earthquakes can include fires resulting from ruptured electric and gas connections and other sources. Suppressing fires can be complicated by breaks in water distribution lines. Fires and impassable roads can complicate emergency response, and road closures can limit evacuation routes and timely response to emergencies. To address these problems, the City has nearly completed a **seismic retrofit program** of existing utility lines which cross active faults. In addition, recent infrastructure has been built to withstand fault displacement. However, in the event of a severe earthquake, most or all utility systems could be inoperable for several days.

Table V-1 indicates the type of damage which could be expected with **varying magnitudes** and intensities of earthquakes as measured by the Richter Scale and the Modified Mercalli Intensity Scale. Figure V-2 indicates the amount of groundshaking and related damage which could be expected in Pleasanton due to seismic activity along the Hayward and Calaveras Faults. These faults are expected to cause the most ground-shaking movement in the event of an earthquake.

Non-Earthquake Related Geologic Hazards

Two other non-earthquake related geologic hazards exist in the Planning Area. These include landslides not related to seismic shaking and expansive soils.

Landslides (Figure V-3) can involve both the simple sloughing downslope of a small-sized surficial land mass for a distance of several inches or massive earth movements of many feet. The latter can cause substantial damage to land and structures. Landslides may occur at any time but are more likely during the rainy season, when soils are saturated with water and their cohesive abilities are more likely to break down.

For general planning purposes, a high potential for **active landsliding** should be considered to exist on all slopes bordering the Amador Valley and other hill slopes within the Planning Area, unless site specific geotechnical investigations can demonstrate local stability. However, the Southeast Hills are generally more stable and less prone to slope failure than the eastern slopes of the Pleasanton Ridge.

Development is restricted in areas prone to landslides, slope instability, or with slopes of 25 percent or greater. These areas are generally designated on the General Plan Map as Public Health and Safety. (The Land Use Element discusses the calculation of residential density where slopes, landslides, or geotechnical hazards exist on a property.) Where development is permitted, the City's policy is to require site specific **geologic investigations and soils reports** to be prepared and submitted during the plan review process for any type of development proposed.

These studies recommend measures to mitigate any potential hazards related to grading, construction, and operation of a development. The City's **consulting geologist** reviews the reports for acceptability. Projects must address the recommendations of the City's geologist. Sites must be shown to be stable during adverse conditions such as saturated soils and groundshaking, and during grading for roads, installation of infrastructure, and the creation of building pads. Reports must demonstrate that structures will sustain no more damage due to slope instabilities than damage sustained by a typical building constructed to current California Building Code standards on stable soils when exposed to moderate groundshaking. In unstable areas, the City seeks to minimize grading of slopes for construction or slope stability repairs, limit grading only to where it is essential for development, and prohibit major grading where existing slopes are 25 percent or greater. In areas most prone to landslides or other geologic hazards, the City may require the establishment of a Geologic Hazard Abatement District (GHAD) as a requirement for development. GHADs are districts formed specifically to address geologic concerns. A GHAD may be formed for the purpose of prevention, mitigation, abatement, or control of a geologic hazard; also for mitigation of abatement of structural hazards that are partly or wholly caused by geologic hazards. A "geologic hazard" is broadly defined as an actual or threatened landslide, land subsidence, soil erosion, or any other natural or unnatural movement of land or earth. However, damage that is the result of an earthquake or fault movement is specifically exempted from coverage by the GHAD, in part because the assessments to include protection from land movement due to earthquake would be prohibitively high. Accordingly, residents should not consider the

existence of a GHAD as a substitute for earthquake insurance.

The General Plan Map responds to the potential for landsliding by designating a majority of the land on Pleasanton Ridge as Agricultural and Grazing and Parks and Recreation, and the Southeast Hills as Public Health and Safety. Flatter and generally more stable portions of these areas are designated for Low Density Residential development surrounded by Rural Density Residential development because the potential for landslides and other hazards appears to be sufficiently low in these areas.

Expansive Soils are surface deposits rich in clays that expand when wet and shrink when dried. While this geologic hazard does not produce the catastrophic impacts of a large earthquake, their cumulative economic cost to a community can be considerable. **Shrink-swell** activity in subsurface soils can seriously damage building foundations, streets and other paved areas, sidewalks, curbs and gutters, underground utilities, and swimming pools. When expansive soils are present on a slope, they can promote downslope creep of the entire thickness of surficial deposits present on the slope (in some cases to depths of more than ten feet).

Expansive soils are potentially present at or near the surface in areas in northern Pleasanton and along the northeastern flank of Pleasanton Ridge. A moderate potential exists for their presence throughout the remainder of the Planning Area, and site-specific studies are required to determine their actual presence at a given location. Figure V-5 illustrates the underlying geology of the Planning Area which can be used to identify areas of probable expansive soils.

The Uniform Building Code contains

minimum requirements for construction on expansive soils. These requirements have become more stringent since the 1970's and early 1980's when a number of Pleasanton's residences were constructed and have since suffered some structural and foundation damage due to expansive soils. The City has adopted policies which now require a soils engineer report for development in areas of moderate to highly expansive soils, and all buildings in these areas must be constructed according to the engineer's recommendations. The engineer must also inspect piers and foundations for compliance with the recommendations.

FIRE HAZARDS

Fire hazards exist in both **developed and undeveloped areas**. Those occurring in developed areas typically include buildings, rubbish, automobiles, and grass fires on vacant lots. Those in undeveloped areas often include large brush and grass fires.

Urban Fire Hazards in Developed Areas

Due to the proximity of people and structures, fires in **urban areas** can pose a threat to both life and property. According to ABAG, 903 urban acres in Pleasanton are subject to high or very high wildfire threat, while 6,157 urban areas are in wildland-urban interface threat areas.

Those **structures** posing the greatest fire hazards include unsprinklered buildings, public assembly buildings, institutions, multiple-family residential structures, shopping centers, hazardous use occupancies, multi-story large floor area occupancies and homes in and near wildland areas..

The majority of fires in Pleasanton's urbanized area tend to be vehicle, building, grass, and refuse fires. Historically, structural fires have occurred mostly in residential buildings because of the City's large proportion of housing.

In the future,; the existing housing stock will age; and some additional residential developments will be built in undeveloped areas adjacent to wild fire hazard areas. These trends might **increase the chance of fires** and will require appropriate prevention and safety measures.

Wild Fire Hazards in Undeveloped Areas

Wild fires are usually caused by human activities such as equipment use or smoking, and result in loss of valuable natural resources, soil erosion, and damage to life and property. Once a wild fire has been ignited, its outcome is affected by three environmental factors: **fuel, climate, and topography**.

The quantity and type of vegetation available for burning is called **fuel loading**. **Woodlands** over six feet in height and covering 20 percent or more of the ground area is considered heavy fuel loading. **Scrub** including brush, shrubs, and other perennial vegetation less than six feet and having similar coverage is considered medium fuel loading. **Open areas** including grasslands, fields, and barren land, are considered light fuel loading.

Climate conditions which affect the severity of fires include wind, relative humidity, and precipitation.

Topography influences wild fire behavior and the ability of firefighters to suppress fires once they occur. Fires tend to burn more rapidly upslope than down, and the steeper the slope

the greater the rate at which the fire spreads. **Steep slopes** also contribute to the channeling effects of winds which spread fires more quickly. In addition, steep slopes increase travel times for fire vehicles and firefighters and restrict the methods possible for fighting the fire.

Map X describes fire hazard zones based on a combination of the environmental factors mentioned above. These hazard ratings are intended to provide a general appraisal of the chances for a fire to develop and break out of control. It is important to note that the descriptions given the three ratings avoid the use of a low rating because no portion of the natural landscape can be considered a low fire hazard.

Public Resources for the Mitigation of Fire Hazards

Pleasanton is served by the Livermore Pleasanton Fire Department (LPFD). The Livermore and Pleasanton Fire Departments consolidated through a joint powers authority in 1996, in order to provide more efficient and effective service to the two communities. The LPFD budget is divided between the cities of Pleasanton and Livermore through a cost sharing plan that enables each City to pay its fair share of the department's operating expenses. Each City buildings and maintains its own light-duty vehicles and fire apparatus. The LPFD maintain 10 stations and one training center. The training center, headquarters, and five of the stations are located in Pleasanton, fielding an on-duty force of 18 personnel per day. An additional five fire stations are located in Livermore. Pleasanton fire facility locations are shown in Table X and Figure X.

The Department operates a total of 52

vehicles. These include 10 fire prevention vehicles, 10 Type I fire engines (the “classic” fire engine with a minimum 1,000 gallon per minute pump, 400 gallon water tank, and 20 foot ladder); four Type III vehicles (a large, four-wheel drive engine for wildland fires, with a minimum 120 gpm pump and 300 gallon water tank) and eight Type IV vehicles (similar to a large pick-up truck, also for use in wildland fires, with a minimum 50 gpm pump and 200 gallon water tank); two ladder engines; and seven utility vehicles such as rescue vehicles and a volunteer van.

The Livermore-Pleasanton Fire Department is responsible for fire protection and suppression for all areas within the city limits in addition to providing contractual services in a number of developed areas outside the city limits including Happy Valley, the Remen Tract, and the Castlewood Country Club. The California Department of Forestry's Sunol Range Station has jurisdiction in the Pleasanton Ridge, Southeast Hills, and several pockets of unincorporated land adjacent to Pleasanton's city limits.

The location of fire stations determines in large part the time it takes for a fire engine to travel from the station to the location of the fire.

The term response time is undergoing a positive change in the fire service in order to more accurately describe actual performance. In years past, departments used the term “average” to describe their response time performance. This figure is very misleading as statistically the term average means that 50% of the data points measured exceed the mean or mid-point. For fire department purposes, responses worse than average are not desirable. The current trend for response time measures (adopted by the LPFD since consolidation) is to report the fractile measure

or said another way, the percent of the whole measure actually completed. Thus instead of stating a response time goal of an “average of five minutes,” we would more clearly state, “respond within five minutes 90% of the time.”

Additionally, there was no common definition among American fire agencies as to what comprises response time – some agencies measured it from the time of 911 call answer, others from the time the fire crew was notified, and still others from the time the fire engine was actually rolling. All agreed to stop the measure when the unit arrived at the curb at the emergency location. The current best practice, (also adopted by the LPFD) is to measure *total reflex time* and define it as the time from the answer of the 911 call to the unit being wheels stopped at the scene. This is the time the customer perceives from the 911 call to help arriving.

A seven-minute total reflex time measure is comprised of five-minutes travel time, plus one-minute for dispatch processing and one minute for the crew to get dressed in protective clothing and get the engine rolling. Prior to consolidation, both cities used a “five” minute *average* response time measure that was usually defined as travel minutes, not total reflex.

The majority of the City lies within a five-minute travel time from one of the five fire stations. However, developments which are located outside the five-minute response time are required to provide additional fire mitigation measures, which include at a minimum, automatic fire sprinkler systems.

For greater alarm structure and wildland fires, the Livermore Pleasanton Fire Department participates in the Alameda County and statewide fire **mutual aid agreements** which provides for additional fire suppression services, personnel, and support equipment.

Another important requirement in fire suppression is adequate **fire flow**, which is the amount of water, expressed in gallons per minute, available to control a given fire. The total fire flow needed to extinguish a fire is a function of building construction, occupancy, area, and height; fire loading; and distance between buildings. The City's Fire and water Departments use- the **Insurance Services Office (ISO)** rating system for determining necessary fire flow. Fire flow for a given building is totally dependent on a reliable water supply, standards for which are set nationally and by the City. Pleasanton's fire flow is adequate throughout the City with very few exceptions. In the few areas with inadequate water pressure, new construction is required to be equipped with fire sprinklers until such time as water pressure is brought up to requirements.

Fire Prevention

In addition to adequate means of fire suppression, **fire prevention** efforts are essential to an effective fire protection program. The best way to control a fire is to prevent it from occurring in the first place. The LPFD encourages this approach through its public **education programs** and **regularly scheduled inspection** of all non-residential buildings. The Building and Fire Departments also require built-in **fire protection systems** in certain new developments, including automatic fire sprinklers, fire resistant construction, and

early warning fire detection systems, in addition to access and setback requirements which facilitate firefighters' entry and provide fire separation.

In order to implement fire protection measures, the City of Pleasanton Municipal Code contains four sections that bear directly on fire safety. The **Building Code** provides minimum standards for design, construction, materials, occupancy, location, and maintenance of all buildings within the City. The **Fire Code** regulates how a building is used, how machines and equipment are maintained, how hazardous materials are handled and stored, and how access to and from a site is provided. The **Zoning Ordinance** regulates site location and design, the type and intensity of land uses, building height and separation, access, and street layout. The **Subdivision Ordinance** establishes standards for roadway dimensions, subdivision layout, and public improvements needed to protect public safety. In addition, all new developments are reviewed by City departments for their potential effects on public safety, and conditions are attached to minimize those effects and inspections conducted to ensure proper installation.

FLOODING AND INUNDATION

Background Information

Historically, the Amador Valley has experienced relatively frequent and substantial flooding because many streams which drain large areas of impermeable soils converge in the area. During periods of intense rainfall, runoff rapidly causes stream flows to exceed floodway capacities and inundate adjacent areas of the flat valley floor. Extensive flood

channel improvements required of development projects during the past 20 years have significantly reduced this type of flood hazard.

As a result of good planning and system maintenance, the Livermore-Amador Valley now experiences minimal flood damage compared with other areas of California.

Currently, flood-producing rainfall occurs during the winter months in the Pleasanton area. Storm runoff is concentrated rapidly by the network of tributaries through the hills which discharge into Arroyo Mocho, Arroyo Del Valle and other tributaries to the Arroyo De La Laguna. The tributaries have carved well-defined courses through the hills; but, upon reaching the flat valley, the channels become shallow and inadequate for higher frequency flows.

The main flooding problem is currently caused by the low capacity of the lower reaches of Arroyo De La Laguna, which causes backwater flooding in its tributary channels.

When substantial rainfall does occur, the runoff is rapid and heavy, causing stream-flows to exceed the normal stream courses' capacities and inundates large areas of the flat valley floor. Flooding is not limited to occasions of intense precipitation, however. Flooding may occur following low-intensity precipitation spread over several days, as occurred in storms of 1955 and 1958.

Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) maps flood hazards throughout the country, including Pleasanton. These flood hazard maps, known as Flood Insurance Rate Maps, or FIRMS, are used to identify flood-prone areas, with the most susceptible areas

designated as special flood hazard zones.

Figure V-8 shows the areas which are subject to 100 year and 500 year flooding. 720 urban acres are in the 100-year FEMA flood plain, while 2,261 urban acres are in the 500 year flood plain.

Flood Control Efforts

Special Drainage District 7 of the Alameda County Flood Control and Water Conservation District (Zone 7) is responsible for providing flood control and water resources to the Livermore-Amador Valley, which includes the Cities of Pleasanton, Dublin and Livermore. To ensure controlled drainage of the Valley's surface water runoff, Zone 7 currently manages 39 miles of flood control channels ranging from concrete-lined channels to natural creeks. Streambed channelization along Arroyo De La Laguna, Alamo Canal, Arroyo Mocho, Hewlett Canal, Chabot Canal, Pleasanton Canal and Tassajara Creek has substantially reduced the possibility of extensive flooding, especially by reducing the time of ponding. A major dam on Arroyo Del Valle controls flooding on that waterway.

In September 2002, Zone 7 began the development of the Stream Management Master Plan (SMMP). This plan balances flood protection with water supply, water quality, habitat and environment and recreation and trails objectives for the Valley.

Dam Failure Inundation

As shown in Figure V-7, 6,294 acres in Pleasanton are located within the dam failure inundation hazard area for Lake Del Valle Dam. The 235-foot Del Valle Dam impounds a reservoir with a total capacity of 77,100

acre-feet. To provide a flood control reserve, it normally stores from 25,000 to 40,000 acre-feet. (An acre-foot is 325,900 gallons, enough water to cover one acre of land one foot deep.) This dam is under the jurisdiction of the California Department of Water Resources (DWR), Division of the Safety of Dams. Existing dams under DWR jurisdiction are periodically inspected to ensure adequate maintenance and to direct the owner to correct any deficiencies found. In 2002, the City adopted an evacuation plan as an annex to the Comprehensive Emergency Management Plan.

HAZARDOUS MATERIALS

Products as diverse as gasoline, paint, solvents, film processing chemicals, household cleaning products, refrigerants and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use, or processing, is considered to be a hazardous waste. The handling, transportation, and disposal of such wastes is of concern to all communities. Improper handling of hazardous materials or wastes may result in significant effects to human health and the environment.

Nearly all businesses and residences in Pleasanton generate some amount of hazardous wastes. The most common industrial hazardous wastes in Pleasanton are generated from gasoline service stations, dry cleaners, automotive mechanics, auto body repair shops, machine shops, printers and photo processors. Most of these wastes are petroleum based or hydrocarbon hazardous waste and include cleaning and paint solvents, lubricants, and oils. However, medical wastes, defined as potentially infectious waste from sources such as laboratories, clinics and hospitals, are also included among the

hazardous wastes found in Pleasanton.

In addition to the hazards of stored chemicals, there are hazards of transporting chemicals into and through the area. Most hazardous materials are regularly carried on railroads and the freeways and major roads designated as explosive routes by CALTRANS and the Highway Patrol. The extreme toxicity of some chemicals used in the area and the specialized handling and cleanup procedures required during an accident can close major thoroughfares and necessitate evacuation.

The Union Pacific/Southern Pacific and Western Pacific Railroads conduct rail operations in the Pleasanton area. Cargoes of electronics, fabricated metals, plastics, precision machinery, agricultural chemicals, construction materials, rock/sand/gravel aggregates and other hazardous materials are also shipped over the rail lines.

A spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of people and property. The effects may involve a local site or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or may be eventual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous substance.

The I-580 corridor affords a large amount of truck movement from the Bay Area to the Central Valley. At its eastern end, it connects to Interstate 5, the major north-south route through California, and at its west end, Interstate 80, the major east-west route through Northern California. The weigh station operated by the California Highway Patrol at

Vasco Road reports that, on a month-by-month basis, an average of 25,000 trucks pass through that facility. Approximately 8% of those trucks, or 2,000 trucks per month, display hazardous materials placards. Assuming each vehicle had an average load weight of 35,000 pounds that would convert to approximately 35,000 tons of placarded material a month moving through the I-580 corridor.

Regulatory Agencies

Hazardous materials in Pleasanton are heavily regulated by a range of federal, State, and local agencies. One of the primary hazardous materials regulatory agencies is the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). DTSC is authorized by the U.S. Environmental Protection Agency (EPA) to enforce and implement Federal hazardous materials laws and regulations, which are equally stringent or less stringent than State hazardous materials laws and regulations. DTSC has responsibility for oversight of Annual Work Plan sites (commonly known as State Superfund sites), sites designated as having the greatest potential to affect human health and the environment.

The Hazardous Materials Division of the Livermore-Pleasanton Fire Department (LPFD) has primary responsibility for enforcing most regulations pertaining to hazardous materials in the City of Pleasanton. To better serve these needs, the LPFD has been certified by California EPA to be a Certified Unified Program Agency (CUPA) which is charged with administering six environmental regulatory programs locally.

The LPFD also acts as first responder to hazardous materials incidents within the City and fields a hazardous materials response team

which can handle moderate chemical emergencies.

The Livermore-Pleasanton Fire Department maintains a Hazardous Materials Area Plan. This Plan satisfies the requirements of Health and Safety Code Division 20, Chapter 6.95, Article 1 and serves as the Livermore-Pleasanton Fire Department's Emergency Response Plan required by the California OSHA. The Area Plan describes the jurisdiction's plan for the prevention of, preparation for and response to hazardous materials incidents and threatened incidents. In addition, and more importantly, the Livermore-Pleasanton Fire Department is the primary and first emergency responder for the control of hazardous materials incidents in the cities of Pleasanton and Livermore. Therefore, it is critical that the Fire Department have a comprehensive plan for minimizing the likelihood of hazardous materials emergencies, and preparing for and responding to such events when they do occur. The Plan describes the hazardous materials present in the community, and how the Fire Department plans, trains, is equipped and responds to hazardous materials emergencies. Copies of the Plan are provided to specified Fire Department staff, each fire station, the Livermore and Pleasanton emergency operation centers, the dispatch center, and the State Office of Emergency Services.

Alameda County Hazardous Waste Management Plan

Hazardous waste programs in Pleasanton are also governed by the Alameda County Hazardous Waste Management Plan. The purpose of the Alameda County Hazardous Waste Management Plan is to forecast the

potential future waste generation in the County, to encourage an aggressive waste reduction strategy, and to establish acceptable siting criteria.

Household hazardous waste drop off is available three days each month through Alameda County at a location in Livermore near Vasco Road.

AVIATION HAZARDS

Airports

Although not located within the Pleasanton Planning Area boundary, the Livermore Municipal Airport affects land uses in Pleasanton in the form of noise, safety and air quality. Noise and safety concerns are addressed by the Alameda County Airport Land Use Commission (ALUC) in the Airport Land Use Policy Plan of 1986, and the City of Livermore's adopted Airport Protection Area (1993). The development of the Airport and phasing of improvements is addressed in the Livermore Municipal Airport Master Plan (adopted December 1975). In March 2004, the City of Livermore released a Public Review Draft Master Plan Update which outlined plans for airport expansion, including additional hangar space, office space, expansion of services serving aviation uses, and creation of a southern parallel taxiway. Due to considerable public opposition from residential neighbors in Pleasanton and Livermore, the draft was withdrawn pending the completion of noise studies and the implementation of noise reduction measures.

The Airport Land Use Policy Plan delineates several boundaries, parts of which are located within Pleasanton's Planning Area. All the following are illustrated on Figure V-9. The General Referral Area is the area which is now or could in the future be affected by airport operations. This area is also referred to as the "airport influence area" and recent legislation (AB 2776, Simitian) requires prospective purchasers of property within this area be notified of the proximity of an airport. Proposed projects within this area must also be referred to the ALUC for its review and determination of consistency with the Airport Land Use Policy Plan. This area extends west to Santa Rita Road in Pleasanton.

The ALUC has also adopted a Height Referral Area, noise impacts zones and safety zones at both ends of airport runways. These boundaries and the policies that apply within them are described in detail in the Land Use Policy Plan.

In addition to the above, in 1993, the ALUC was amended to include an Airport Protection Area within which new residential development or the intensification of existing development is prohibited. This area extends generally 5,000 feet east, north and south of the runways, and 7,000 feet west of the runways.

Pleasanton's General Plan and Stoneridge Drive Specific Plan must be consistent with the Airport Land Use Policy Plan and Airport Protection Area plan. The General Plan Map does not contain any land within the Livermore Airport safety zone. Substantial areas within the Pleasanton Planning Area lie within the Airport's height referral area, although they are located at sufficient distances so that all uses allowed under the City's 85-foot zoning height limit for commercial and industrial uses and 40-foot limit for residential uses would be compatible. No residential land use designations are located within the Airport Protection Area.

Heliport-

The Valley Care Medical Center operates a heliport at its hospital on Santa Rita Road. This heliport is operated on an as-needed basis for emergency medical transportation.

EMERGENCY OPERATIONS

As required by State law, the City of Pleasanton has adopted an **Emergency Operations Plan**⁵ to provide for the safety of the community in the event of a natural disaster (earthquake, flood or fire), human-caused emergencies, and technological incidents as as, civil disturbance, or hazardous materials spill.

The Plan provides a framework for coordination of response and recovery efforts within the City in coordination with local, State and Federal agencies. It also establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

Pleasanton's Emergency Management Plan

conforms to the Standardized Emergency Management System (SEMS), the National Incident Management System (NIMS), and the National Response Plan (NRP). The City's Plan also establishes response policies and procedures to protect life, property and the environment, outlines coordination requirements, and provides a basis for unified training and response exercises to ensure compliance.

The following plans/procedures are also included in Pleasanton's Emergency Plan: warning and communications, evacuation, shelter and mass care, hazard assessment, terrorism annex, hazardous materials response, hazard mitigation, continuity of government, disaster recovery and family disaster preparedness. A copy of Pleasanton's Comprehensive Emergency Management Plan is available at the Pleasanton Library.

The City has established its Police Department facility at 4833 Bernal Avenue as the **Emergency Operations Center** which is designed to function as a communications and administrative headquarters in the event of an emergency.

Public Safety Goals, Policies, and Programs

The following goals, policies, and programs, in addition to those contained in other Elements, constitute an action program to implement the objectives described in this Element.

V. PUBLIC SAFETY GOALS, POLICIES, AND PROGRAMS

Seismic Safety

Goal 1: To minimize the risks to lives and property, and to minimize the potential liability to the City, due to **seismic activity** within the Planning Area.

Policy 1: Restrict development in areas prone to **seismic safety hazards**.

Program 1.1: Comply with the **Alquist-Priolo Act** and other seismic safety criteria established by the City of Pleasanton.

Program 1.2: Prohibit construction of habitable structures within at least 50 feet of an **identified active fault trace** as shown in site-specific geologic studies.

Program 1.3: Prohibit construction of facilities and systems vital to the public health and safety (e.g., water facilities, fire stations, hospitals, communication facilities, etc.) within the **Alquist-Priolo Earthquake Fault Zones**.

Policy 2: Investigate the potential for seismic hazards during the development review process, and implement soils engineering and construction standards which minimize potential **danger from earthquakes**.

Program 2.1: Require site-specific soils, geologic, and/or geotechnical **engineering studies** prior to development approval of structures for human occupancy for any project proposed within areas shown on current Alquist-Priolo Earthquake Fault Zones Maps. Also, require such studies for any project proposed within areas identified with "Moderately High" to "Extreme" seismic shaking amplification (Table V-3 and Figure V-4).

Program 2.2: Design and construct all structures to address potential seismic and geologic hazard conditions according to the **California Uniform Building Code** standards or more stringent standards. All structures and facilities not addressed by the CBC shall be designed and constructed to mitigate potential seismic and geologic hazards as recommended by site specific soils, geologic, and/or geotechnical engineering studies.

Program 2.3: Design new utility lines that cross an **active fault trace** with appropriate engineering and design mitigations as recommended by site specific soils,

geologic, and/or geotechnical engineering studies.

Program 2.4: Design new bridges and retrofit existing bridges with appropriate engineering and design mitigations in accordance with **CALTRANS standards**.

Program 2.5: Require **technical review and analysis** of soils, geologic, and geotechnical studies by a qualified consulting engineering geologist reporting to the City of Pleasanton. Incorporate the recommendations of the City's consulting engineer into the project design.

Program 2.6: Require professional inspection of foundations, piers, excavation, earthwork, and other aspects of site development during construction. Ensure that all mitigations recommended by the **City's consulting engineer** are incorporated into the project construction.

Policy 3: Require **post-earthquake construction**, if needed, to conform to all City codes and ordinances.

Program 3.1: Require building permits and enforce all current building requirements and codes for **post-earthquake construction**.

Policy 4: Rehabilitate or remove structures in the City which are especially susceptible to **seismic hazards**.

Program 4.1: Update the City's **inventory of structures** located in potentially hazardous areas (Table V-3, Figure V-2, and Figure V-3).

Program 4.2: Develop guidelines and procedures for **rehabilitating structures** located in potentially hazardous areas.

Program 4.3: Retrofit existing **critical utility lines** that cross active faults with automatic shut off devices or other means to accommodate ground movement and surface rupture.

Program 4.4: Comply with State requirements regarding the removal or retrofitting of **unreinforced masonry structures** susceptible to seismic hazards and damage.

Geologic Hazards

Goal 2: To minimize the risks to lives and property, and to minimize potential liability to the City, due to **geologic hazards** within the Planning Area.

Policy 5: Investigate the **potential for geologic hazards** as part of the development review process, and maintain this information for the public record.

Program 5.1: Require site-specific **soils studies** for all new development prior to the issuance of building permits and prior to the approval of final improvement plans in areas with "Moderate," "Moderate to High," or "High" hazards for the following geologic hazards: seismic shaking, lateral spreading, differential settlement, lurch cracking, liquefaction, erosion, and expansive soils.

Program 5.2: Require site-specific **geologic and/or geotechnical engineering studies** prior to development approval in areas with "Moderate," "Moderate to High," or "High" hazards for the following geologic hazards: surface fault rupture, bank failures, rock falls, and landslides; and for areas with slopes equal to or greater than 20 percent.

Program 5.3: Require measures to **mitigate** potential geologic safety hazards during adverse conditions such as saturated soils and groundshaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Mitigation measures identified by the site engineering studies shall be incorporated into the project design.

Program 5.4: Require **technical review and analysis** of geotechnical studies by a qualified consulting geotechnical engineer reporting to the City. Incorporate the recommendations of the City's consulting engineer into the project design.

Program 5.5: Permit development in areas with a **"high" susceptibility** to geologic hazards only when geologic and soils investigations demonstrate that hazards can be mitigated by accepted engineering and construction techniques. Mitigation measures identified by the investigations shall be incorporated into the project design and subject to approval by the City's reviewing geologist/engineer.

Policy 6: Restrict new development of sites with structures intended for human occupancy in any **landslide prone** area and indicated as "Moderate" through "High" hazard for any geologic zone.

Program 6.1: Prohibit new development of sites with structures intended for human occupancy in any **landslide-prone** areas which also are indicated as **"High" hazards** and designated on the General Plan Map as Public Health and Safety.

Program 6.2: Permit development in **landslide-prone** areas identified as **"Moderate" and "Moderate to High"** only when site specific geologic and soils investigations demonstrate that geologic hazards can be mitigated. Sites must be shown to be stable during adverse conditions such as saturated soils, groundshaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Engineering studies shall demonstrate that structures in landslide prone areas would sustain no more damage due to slope instabilities than damage sustained by a similar building in the Pleasanton Planning Area constructed to current CBC standards and located on soils with a low susceptibility to failure when exposed to moderate groundshaking.

Program 6.3: Require developers to include **drainage, erosion, and landslide mitigation measures** to reduce landslide potential.

Program 6.4: Design irrigation systems to minimize the potential for **soil saturation, excessive run-off**, and other factors deemed to contribute to slope instability.

Program 6.5: Design grading plans to **minimize earth moving activity** and site grading in areas of potential land instability and in areas identified as having a "Moderate" through "High" landslide potential.

Program 6.6: Establish Geologic Hazard Abatement Districts (GHADs) in areas of new development where landslide risks or other geologic hazards are known to exist, to assume ongoing monitoring and maintenance of slopes and drainage facilities occurs. GHADs should be considered for hillside development such as west of Foothill Road and other areas prone to seismic, landslide, and other geologic hazards.

Policy 7: Implement standards to **assist City decision-makers** in the evaluation of development proposals and management of geologic hazard areas.

Program 7.1: Establish a **list of** pre-qualified geologic, geotechnical, soils, and structural engineering **firms** acceptable to the City as reviewing consultants.

Program 7.2: Review and update as necessary the City's "**Standards for Geotechnical and Engineering Reports.**"

Program 7.3: Adopt updates to the **California Building Code** and other safety standards in a timely manner.

Program 7.5: Develop a **grading ordinance** which establishes criteria for evaluating and controlling grading due to development.

Program 7.6: Implement a study to be conducted by geologic/geotechnical/soils engineers with the goal of **relating quantifiable measures** (such as safety factors, amount of earth movement, ground-shaking potential/strength, etc.) to levels of structural damage which minimize earthquake danger to building occupants.

Fire Hazards

Goal 3: To minimize the risks to lives and property due to **fire hazards** within the Planning Area, and to provide the highest quality of emergency response service feasible.

Policy 8: Provide an adequate level of **fire equipment and personnel** to protect the

community.

Program 8.1: Incorporate Fire Department expansion needs into each year's **Capital Improvement Program and Operating Budget**.

Program 8.2: Require new development to pay for **fire safety improvement** needs generated by the new development.

Program 8.3: Maintain high standards of hiring **personnel** and provide in-depth training of department personnel to maintain and improve knowledge and skill levels.

Policy 10: Strive to **respond** to all structure fire calls within seven minutes of the time the call for service is received 90 percent of the time.

Program 10.1: Deny proposed developments not within a **five-minute travel time** of a Fire Station unless acceptable mitigations are provided.

Program 10.2: Develop a system of fire hazard **mitigations** based on the probability of occurrence and number of people at risk.

Program 10.3: Evaluate the need for expanded services or facilities as the City grows.

Policy 11: Maintain or improve the City's existing **Insurance Services Office fire protection rating** of three.

Program 11.1: Require developers to finance and construct necessary **water facilities** for their projects when they develop.

Program 11.2: Require that all new developments be provided with sufficient **fire flow facilities** at the time of development at least at the level specified by the Fire Chief.

Program 11.3: Implement the Fire Prevention Bureau's **public education** programs.

Policy 12: Upgrade the level of **fire resistivity** in all new and remodeled structures.

Program 12.1: Continuously update and enforce the City's **Fire and Building Codes** as new technologies occur.

Program 12.2: Maintain a **current inventory** of structures located in hazardous areas.

Policy 13: Require fire mitigation measures in new and existing developments that reduce the fire threat to the structure and occupants. Require development outside the five minute travel time and in high hazard fire zones to provide effective fire prevention measures.

Program 13.1: Require the installation of Building and Fire Code compliance fire detection and alarm equipment in residential and commercial structures.

Program 13.2: Require the installation of automatic fire sprinkler protection in all structures as defined by adopted City ordinances.

Program 13.3: Provide access to all structures in the Wildland-Urban interface areas identified by the City as well as all new and existing developments when construction or building modification occurs.

Program 13.4: Partner with the California Department of Forestry and Fire Prevention and Firewise Communities to identify measures that reduce the fire threat in high hazard areas.

Program 13.5: Require development to address wildland interface issues such as greenbelts, defensible space around structures, and other preventative measures.

Program 13.6: Require all projects in the Wildland-Urban Interface area seeking building or planning approval to landscape with fire resistant plant materials.

Flood Hazards

Goal 4: To minimize the risks to lives and property due to **flood hazards**.

Policy 14: Inform the public of the Del Valle Dam **evacuation system**.

Program 14.1: Conduct public meetings and issue press releases regarding **public evacuation** procedures.

Policy 15: Prohibit all development within the **100-year flood zone** unless mitigation measures which meet Federal Insurance Administration criteria are provided.

Program 15.1: Abide by the regulations of the **National Flood Insurance Program**, and continuously update related City ordinances.

Program 15.2: Support Zone 7's efforts to complete the **improved arroyo drainage system** in conformance with the Stream Management Master Plan for the Planning Area in order to remove properties from flood hazard zones.

Program 15.3: Cooperate with Zone 7 to preserve riparian corridors and **recreation potential** when making improvements.

Program 15.4: Cooperate with Zone 7 in the development of an **arroyo maintenance plan**, including those areas in private ownership.

Program 15.5: Maintain or improve the City's Community Rating System classification of 3 for the National Flood Insurance program by implementing require flood related activities.

Hazardous Materials

Goal 5: To minimize the risks to lives and property due to potential exposure to **hazardous materials**.

Policy 16: Regulate the transportation, delivery, use, and storage of **hazardous materials** within the city limits.

Program 16.1: Enforce the provisions of the City's **Hazardous Materials Storage Permit Ordinance**.

Program 16.2: Require scheduled **on-site monitoring** of all sewer outfalls for sites permitted to store hazardous materials.

Program 16.3: Expand the Fire Department's **automated data system** to speed identification of hazardous materials and users in the event of an emergency.

Program 16.4: Promote the safe transportation of hazardous materials through Pleasanton by: 1) maintaining formally designated hazardous materials carrier routes to direct hazardous materials away from populated and other sensitive areas; 2) prohibiting the parking of vehicles transporting hazardous materials on City streets; and 3) requiring that new pipelines and other channels carrying hazardous materials avoid residential areas and other immobile populations to the greatest extent possible.

Program 16.5: Require emergency response plans for all large generators of hazardous waste to be submitted as part of land use applications.

Policy 17: Ensure that hazardous materials and potential contamination are **remediated** prior to development.

Program 17.1: When reviewing applications for new development in areas historically used for commercial or industrial uses, the City shall require environmental investigation as necessary to ensure that soils, groundwater, and

buildings affected by hazardous material releases from prior land uses, and lead and asbestos potentially present in building materials, would not have the potential to affect the environment or the health and safety of future property owners or users.

Policy X: Continue to encourage the reduction of solid and hazardous wastes generated within the City, in accordance with Countywide plans.

Policy X: Ensure convenient access for Pleasanton residents for the disposal of household hazardous wastes.

Program X.X: Support Alameda County's effort to provide a local drop-off point for household hazardous waste.

Air Navigation Hazards

Goal 6: To minimize the risks to lives and property due to **air navigation hazards** generated by the Livermore Municipal Airport.

Policy 18: Deny any development plan which would create any **air navigation hazards** due to electrical interference, smoke, glare, lighting, or other navigational hazard in the General Referral Area.

Program 18.1: Refer all General Plan amendments, specific plan amendments and rezonings proposed within the **General Referral Area** to the Alameda County Airport Land Use Commission (ALUC).

Program 18.2: Refer all General Plan amendments, specific plan amendments, and rezonings which lie within the Livermore Municipal Airport **Height Referral Area** and which may create buildings exceeding airport height standards to the Alameda County ALUC.

Program 18.3: Review and evaluate potential air navigation hazards through the City's **environmental review process**.

Program 18.4: Prohibit residential uses within the **Livermore Municipal Airport Protection Area**.

Catastrophic Emergency

Goal 7: Protect the public in the event of a natural or man-made disaster.

Policy 19: Prepare and keep current City emergency procedures in the event of potential natural or man-made disaster.

Program 19.1: Complete regularly-scheduled reviews and updates of the City's emergency management plans.

Program 19.2: Conduct periodic mock exercises using emergency response systems to test the effectiveness of City procedures included in the emergency management plans.

Policy X: Promote public safety through public education programs.

Program X.X: Support earthquake preparedness activities such as strapping water heaters, promoting seismic retrofit, organizing periodic earthquake drill, providing first aid training, Community Emergency Response Team (CERT) classes, and disaster preparedness courses to neighborhoods groups, and encouraging residents and businesses to stockpile emergency food, water and medical supplies.

Police Services

Goal 8: To provide the highest quality of **Police services** within the City, as feasible.

Policy 20: **Maintain and enhance**, where feasible, the level of police equipment and personnel to protect the community.

Program 20.1: Incorporate Police Department's potential expansion needs into each year's **Capital Improvement Program** and **Operating Budget**.

Program 20.2: Require new development to pay for **police safety** improvements required of that development.

Program 20.3: Maintain **high standards** of hiring personnel, and provide in-depth training of department personnel to maintain and improve knowledge and skill levels.

DEFINITIONS

Active Fault - A fault which has exhibited displacement or seismic activity within the past 11,000 years.

Alluvium - A general term for unconsolidated sediment (such as silt, sand, and gravel) deposited during relatively recent geologic time by a stream or other running water.

Fluvial deposits - Sedimentary deposits produced by the action of a stream or river.

Geologic Studies - Studies prepared by a registered geologist and which address faulting, slope stability, erosion, seismicity, and related hazards.

Geotechnical Engineering Studies - Studies prepared by registered engineers and which address subsurface soils, drainage, and other conditions for purposes of designing foundations, pavements, retaining walls, and other improvements affected by soil conditions.

Maximum Credible Earthquake (MCE) - The largest earthquake that is likely to be generated along an active fault.

Potentially Active Fault - A fault which has moved during the past two to three million years but not proven to have moved within the past 11,000 years.

Seismicity - The earth movement phenomena as related to earthquakes; also a measure of the area's susceptibility to earthquakes.

FOOTNOTES (TO BE REVISED)

¹ For a more detailed explanation of seismic and geologic hazards, please see Merrill & Seeley, Supplement to the 1986 Seismic Safety Element, March 1985.

² Association of Bay Area Governments, The San Francisco Bay Area — On Shaky Ground, 1995.

³ City of Pleasanton, 1995 Growth Management Report Update, October 1995.

⁴ Alameda County Planning Department, Alameda County Airport Land Use Policy Plan, June 1986; and Airport Protection Area Amendment, January 1993.

⁵ City of Pleasanton, Emergency Operations Plan, as amended.

TABLE V-1
EARTHQUAKE MAGNITUDE AND INTENSITY

Richter Magnitude <u>(M)</u>	<u>(MM)</u>	Modified Mercali Intensity Scale of 1934
2	I	Not felt except by a very few under especially favorable circumstances.
2	II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
3	III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
4	IV	During the day, felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
4	V	Felt by nearly everyone; many awakened. Some dishes, windows, etc. broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
5	VI	Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
5	VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly-built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.

TABLE V-1
EARTHQUAKE MAGNITUDE AND INTENSITY
(Continued)

Richter Magnitude <u>(M)</u>	<u>(MM)</u>	Modified Mercalli Intensity Scale of 1934
6	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 motor cars are disturbed.
7	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.
7	X	Some well-built wooden structures destroyed; most masonry and frames structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed over banks.
8+	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 gently.
8+	XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.

* *Magnitude (M) and intensity (MM) comparison at epicenter (Richter, 1958).*

Source: Merrill & Seeley, Inc.

TABLE V-2

SEISMIC PARAMETERS FOR ACTIVE FAULTS

<u>Fault</u>	<u>Distance from Pleasanton (Miles)*</u>	<u>Maximum Historic Earthquake (M)*</u>	<u>Approximate Intensity in Planning Area (MM)**</u>	<u>Maximum Credible Earthquake (MCE)*</u>
Calaveras	0	6.2**	IV	7.0
Concord	20	5.4	II-III	6.3
Greenville	11	5.9	VI-VII	6.5
Hayward	9	6.8	VII-VIII	7.0
San Andreas	24	8.3	VII-VIII	8.3

* *Source cited in text*

** *M 6.2 is April 24, 1984 Morgan Hill earthquake. Intensities MM VII to VIII felt in Amador-Livermore Valley during July 3, 1861 earthquake (estimated M 5.6 to 6+) on Calaveras Fault with epicenter near Pleasanton Planning Area (Toppozada and others, 1981). The historical record is poor.*

Source: *Merrill, Seeley, Mullen, Sandefur, Inc.*

Table V-3 Description of Geologic Zone Map

**TABLE V-4
DESCRIPTION OF OCCUPANCIES BY GROUP AND DIVISION**

GROUP AND DIVISION	SECTION	DESCRIPTION OF OCCUPANCY
A-1	303.1.1	A building or portion of a building having an assembly room with an occupant load of 1,000 or more and a legitimate stage.
A-2		A building or portion of a building having an assembly room with an occupant load of 1,000 or less and a legitimate stage.
A-2.1		A building or portion of a building having an assembly room with an occupant load of 300 or more without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B occupancy.
A-3		A building or portion of a building having an assembly room with an occupant load of less than 300 without a legitimate stage, including such buildings used for educational purposes and not classed as a Group E or Group B occupancy.
A-4		Stadiums, reviewing stands, and amusement park structures not included within other Group A occupancies.
B	304.1	A building or structure, or portion thereof, for office, professional or service-type transactions, including storage of records and accounts; eating and drinking establishments with an occupant load of less than 50.
E-1	305.1	Any building used for educational purposes through the 12th grade by 50 or more persons for more than 12 hours per week or four hours in any one day.
E-2		Any building used for educational purposes through the 12th grade by less than 50 persons for more than 12 hours per week or four hours in any one day.
E-3		Any building or portion thereof used for daycare purposes for more than six persons.
F-1	306.1	Moderate-hazard factory and industrial occupancies include factory and industrial uses not classified as Group F, Division 2 Occupancies.
F-2		Low-hazard factory and industrial occupancies include facilities producing non-combustible or non-explosive materials which during finishing, packing, or processing do not involve a significant fire hazard.
H-1	307.1	Occupancies with a quantity of material in the building in excess of those listed in the UBC which present a high explosive hazard.
H-2		Occupancies with a quantity of material in the building in excess of those listed in the UBC which present a moderate explosion hazard or a hazard from accelerated burning.
H-3		Occupancies with a quantity of material in the building in excess of those listed in the UBC which present a high fire of physical hazard.

GROUP AND DIVISION	SECTION	DESCRIPTION OF OCCUPANCY
H-4		Repair garages not classified as Group S, Division 3 Occupancies.
H-5		Aircraft repair hangars not classified as Group S, Division 5 Occupancies and heliports.
H-6	307.1 and 307.11	Semiconductor fabrication facilities and comparable research and development areas when the facilities in which hazardous production materials are used, and the aggregate quantity of material is in excess of UBC limits.
H-7	307.1	Occupancies having quantities of materials in excess of those listed in the UBC that are health hazards per the UBC.

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TABLE V-4

DESCRIPTION OF OCCUPANCIES BY GROUP AND DIVISION
(Continued)

GROUP AND DIVISION	SECTION	DESCRIPTION OF OCCUPANCY
1-1.1	308.1	Nurseries for the full-time care of children under the age of six (each accommodating more than five children), hospitals, sanitariums, nursing homes with non-ambulatory patients, and similar buildings (each accommodating more than five patients).
I.1.2		Health-care centers for ambulatory patients receiving out-patient medical care which may render the patient incapable of unassisted self-preservation (each tenant space accommodating more than five persons).
I-2		Nursing homes or ambulatory patients, homes for children six years of age or over (each accommodating more than five persons).
I-3		Mental hospitals, mental sanitariums, jails, prisons, reformatories, and buildings where personal liberties of inmates are similarly restrained.
M	309.1	A building or structure, or a portion thereof, for the display and sale of merchandise, and involving stocks or goods, wares, or merchandise incidental to such purposes and accessible to the public.
R-1	310-1	Hotels and apartment houses, congregate residences (each accommodating more than ten persons).
R-3		Dwellings, lodging houses, congregate residences (each accommodating ten or fewer persons).
S-		Moderate-hazard storage occupancies including buildings or portions of buildings used for storage of combustible materials not classified as Group S, Division 2 or Group H Occupancies.

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S-2		Low-hazard storage occupancies including buildings or portions of buildings used for storage of non-combustible materials.
S-3		Repair garages where work is limited to exchange of parts and maintenance not requiring open flame or welding, and parking garages not classified as Group S, Division 4 Occupancies.
S-4		Open parking garages.
S-5		Aircraft hangars and helistops.
U-1		312.1
U-2	Fences over six feet high, tanks, and towers.	

Table V-5 Wildland Fire Severity Scale

**TABLE V-6
CRITICAL FACILITIES**

1. Fire Station 1 - 4444 Railroad Avenue
2. Fire Station 2 - 6300 Stoneridge Mall Road
3. Fire Station 3 - 3200 Santa Rita Road
4. Pleasanton City Hall - 200 Old Bernal Avenue
5. Police Department - 4833 Bernal Avenue

Potential Mass Care Facilities:

6. Stoneridge Shopping Mall - One Stoneridge Mall Drive
7. Signature Center - Hopyard Road
8. Alameda County Fairgrounds - 4501 Pleasanton Avenue
9. Castlewood Country Club - Castlewood Drive
10. Kaiser Center for Technology - 6177 Sunol Boulevard
11. Galaxy Eight Theater - 4001 Rosewood Drive
12. Camp parks - Dougherty Road
13. Veterans Hall - 301 Main Street
14. ClubSport - 7090 Johnson Drive
15. Schoebers Racquetball Spa - 5341 Owens Court
16. Carpenters Training Center - 2350 Santa Rita Road
17. Amador Valley High School - 1155 Santa Rita Road
18. Foothill High School - 4375 Foothill Road
19. Pleasanton School - 4750 First Street
20. Harvest Park Middle School - 4900 Valley Avenue
21. Alisal School - 1454 Santa Rita Road
22. Fairlands School - 4151 West Las Positas Boulevard
23. Valley View School - 480 Adams Way
24. Walnut Grove School - 5199 Black Avenue
25. LDS Church - 6101 Valley Avenue
26. St. Augustine's Church - 3999 Bernal Avenue
27. Harvest Valley Christian Church - 3200 Hopyard Road
28. Kaiser-Permanente Medical Center - 5600 Stoneridge Mall Road
29. Valley Care Medical Center - 5555 West Las Positas Boulevard
30. Holiday Inn Hotel - 11950 Dublin Canyon Road
31. Wyndham Garden Hotel - 5990 Stoneridge Mall Road
32. Hilton Hotel - 7050 Johnson Drive
33. Four Points Sheraton Inn - 5121 Hopyard Road
34. Marriott Hotel - 5059 Hopyard Road
35. Motel 6 - 5102 Hopyard Road
36. Super 8 Motel - 5575 Owens Court

TABLE V-6

CRITICAL FACILITIES
(Continued)

- 37. Pleasanton Middle School - 5001 Case Avenue
- 38. Presbyterian Community Church - 4300 Mirador Drive
- 39. Trinity Lutheran Church - 1225 Hopyard Road
- 40. St. Clare's Episcopal Church - 3350 Hopyard Road
- 41. Valley Community Church - 4455 Del Valle Parkway
- 42. Evangelical Free Church - 6900 Valley Trails Drive
- 43. Pleasanton Senior Center - 5353 Sunol Boulevard
- 44. Pleasanton Operations Service Center - 3333 Busch Road

Private and Public Utilities Emergency Resources

Water: City of Pleasanton - Emergency Repair
3333 Busch Road, Pleasanton, CA 94566
Alameda County Flood Control District - Zone 7
5997 Parkside Drive, Pleasanton, CA 94588

Sanitation: Dublin San Ramon Services District
6950 Stoneridge Drive, Pleasanton, CA 94588

Electricity and Gas: Pacific Gas and Electric Company
998 Murrieta Boulevard, Livermore, CA 94550

Telephone: Pacific Telephone & Telegraph Company
4400 Black Avenue, Pleasanton, CA 94566

Petroleum Pipelines: Petroleum Pipelines
135-S Nison Circle, Concord, CA 94520

Emergency Medical Care: Valley Care Medical Center
5555 West Las Positas Boulevard, Pleasanton, CA 94588
Kaiser-Permanente Medical Offices
7601 Stoneridge Drive, Pleasanton, CA 94588

Media Center: City of Pleasanton
200 Old Bernal Avenue, Pleasanton, CA 94566
includes restrooms, water fountains, conference rooms, telephones, desks,
etc.

Figure V-1 Local and Regional Faults

Figure V-2

Susceptibility to Seismic Shaking



Figure V-3

Special Studies Zones and Landslides



Figure V-4

Geologic Zones



Figure V-5

Geology

Figure V-6

Wild Fire Risk Areas



Figure V-7

Flood Inundation Area



Figure V-8

100-Year Flood Zones



Figure V-9

Livermore Airport Referral Area



Figure V-10

Critical Facilities

