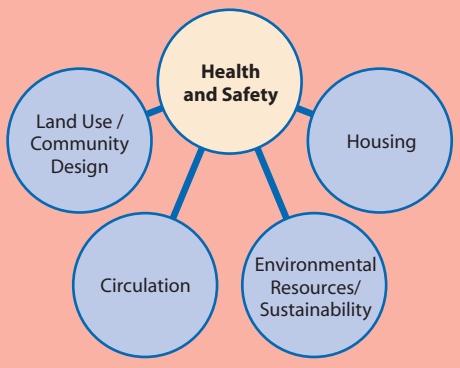
Section 6
Health and Safety



CONTENTS

INTRODUCTION

The City of Cupertino will be a safe, progressive and balanced community, where residents can live and businesses thrive in a protected and secure environment. The purpose of the Health and Safety Element is to identify and evaluate hazards in the community and to protect it from the risks associated with these hazards. To ensure the protection of the community, the Health and Safety Element sets forth goals, policies, and strategies addressing the potential risks associated with these hazards. Implementation of these goals, policies and strategies will prevent or minimize injuries to life and damages to property.

Cupertino will maintain a high level of preparedness to protect the community from risks to life, property and the environment associated with both natural and human-caused disasters. Natural hazards are earthquakes, floods, wildfires and landslides. Human-caused hazards are usually the result of carelessness, e.g., urban fires, failures of inappropriately designed structures or long term exposure to excessive noise. Cupertino will provide effective and efficient fire services to protect the community from both wild and urban fires. It will provide paramedic services and life-safety aid to victims of catastrophic events. Cupertino will also provide health services to promote the well being of the community, police and crime prevention services to ensure the safety of the community and Emergency Services disaster planning and training to enhance our ability to respond to disasters.

GEOLOGIC AND SEISMIC HAZARDS

Cupertino is located in the seismically active San Francisco Bay region, which hosts several active earthquake faults. It is important for the community to be prepared for all emergencies. A well-prepared community is better equipped to cope with any eventuality. Cupertino will use all the available channels of communication to keep the community apprised of the potential risks related to geologic and/or seismic activity.

One of the longest and most active faults in the world, the San Andreas fault, crosses the western portion of Cupertino's planning area. In addition, two other faults that are closely associated with the San Andreas fault, the Sargent-Berrocal and Monta Vista-Shannon fault systems, cross the west portion of the City. These faults manifest a variety of displacement styles. Movement on the San Andreas fault is predominantly right-lateral strike-slip, where the earth ruptures in a horizontal fashion, with the opposite sides of the fault moving to the right with respect to each other. Movement on the Sargent-Berrocal and Monta Vista-Shannon faults is more variable in style. Both of these faults are characterized by "thrust" faulting, where a significant amount of vertical "up-down (so called dip-slip) displacement occurs on an inclined plane, and one side of the fault is elevated (i.e., thrust over) the other side. Figure 6-A below illustrates the above-mentioned behavior of the various faults.

The primary geologic hazards within Cupertino are landslides and seismic impacts related to local active fault traces. Seismically induced ground shaking, surface fault rupture and various forms of earthquake-triggered ground failure are anticipated within the City during large earthquakes. These geologic hazards present potential impacts to property and public safety. Six identified categories of Geologic Hazards within the City are presented in Table 6-A and are briefly explained. For a more detailed explanation see the Technical Appendix.

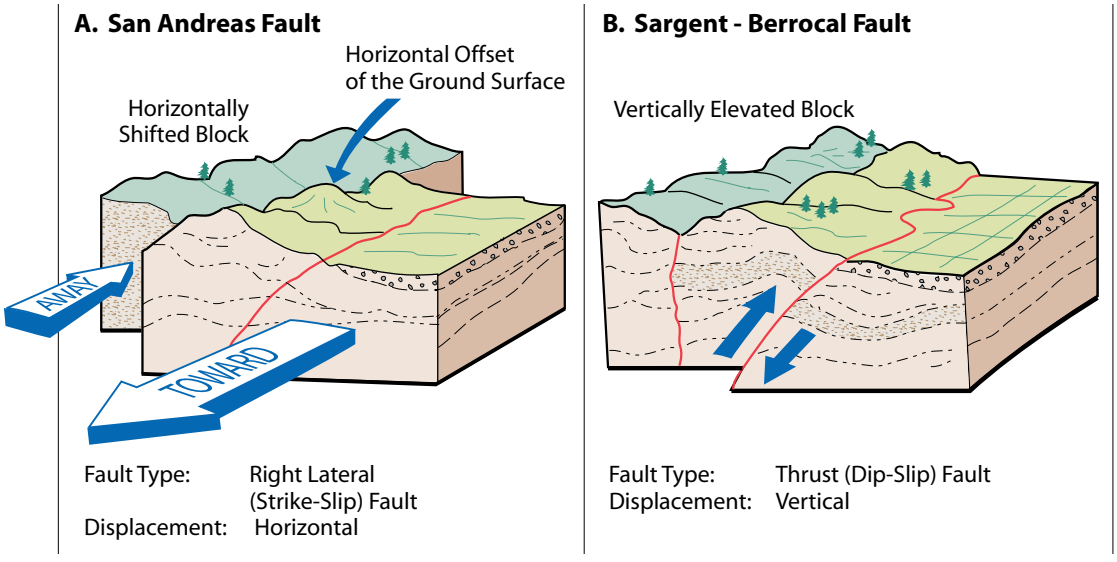


Figure 6-A. Diagrams Exhibiting Faults Within the Cupertino Planning Area Characterized By Horizontal (A) and Vertical (B) Displacements.†

Table 6-A. Explanations: Geologic and Seismic Hazards Map of the City of Cupertino Planning Area.

Zone	Description
(F)– Fault Rupture	Area of potential surface fault rupture hazard within 300 feet east and 600 feet west of the Monta Vista and Berrocal faults, and within 600 feet of the San Andreas fault.
(S)– Slope Instability	Area includes all recognized landslide deposits, and steep walls of Stevens Creek canyon, with a moderate to high landslide potential under static or seismic conditions. Area also reflects the mapped zone of potential earthquake-induced landsliding prepared by the California Geological Survey (2002)
(H)– Hillside	Area contains moderate to steep slope conditions not included in the above categories, with an undetermined potential for slope instability.
(L)– Liquefaction / Inundation	Area where local geological, geotechnical and groundwater conditions indicate a potential for liquifaction under seismic conditions. Much of this area also has the potential for periodic flood inundation. The Liquifaction/Inundation Zone is stippled where covered by an overlaying Fault Zone.
(V)– Valley	Area includes all relatively level valley floor terrain not included in the above categories with relatively low levels of geologic hazard risk.

Following the 1983 Coalinga and 1994 Northridge earthquakes, earth scientists became increasingly aware of earthquakes generated by faults not previously observed at the earth's surface. These types of faults are appropriately called "blind faults," and they represent a type of thrust fault that does not rupture completely to the surface. Even though the locations of "blind faults" may not be known with certainty, they are clearly associated with certain types of geologic environments. It is possible that one or more blind faults may be associated with the Monta Vista-Shannon fault system, but significant seismic data collection and analysis would be needed to determine the extent of risk (if any) that "blind faults" may represent within the City.

Geologic and Seismic Hazards

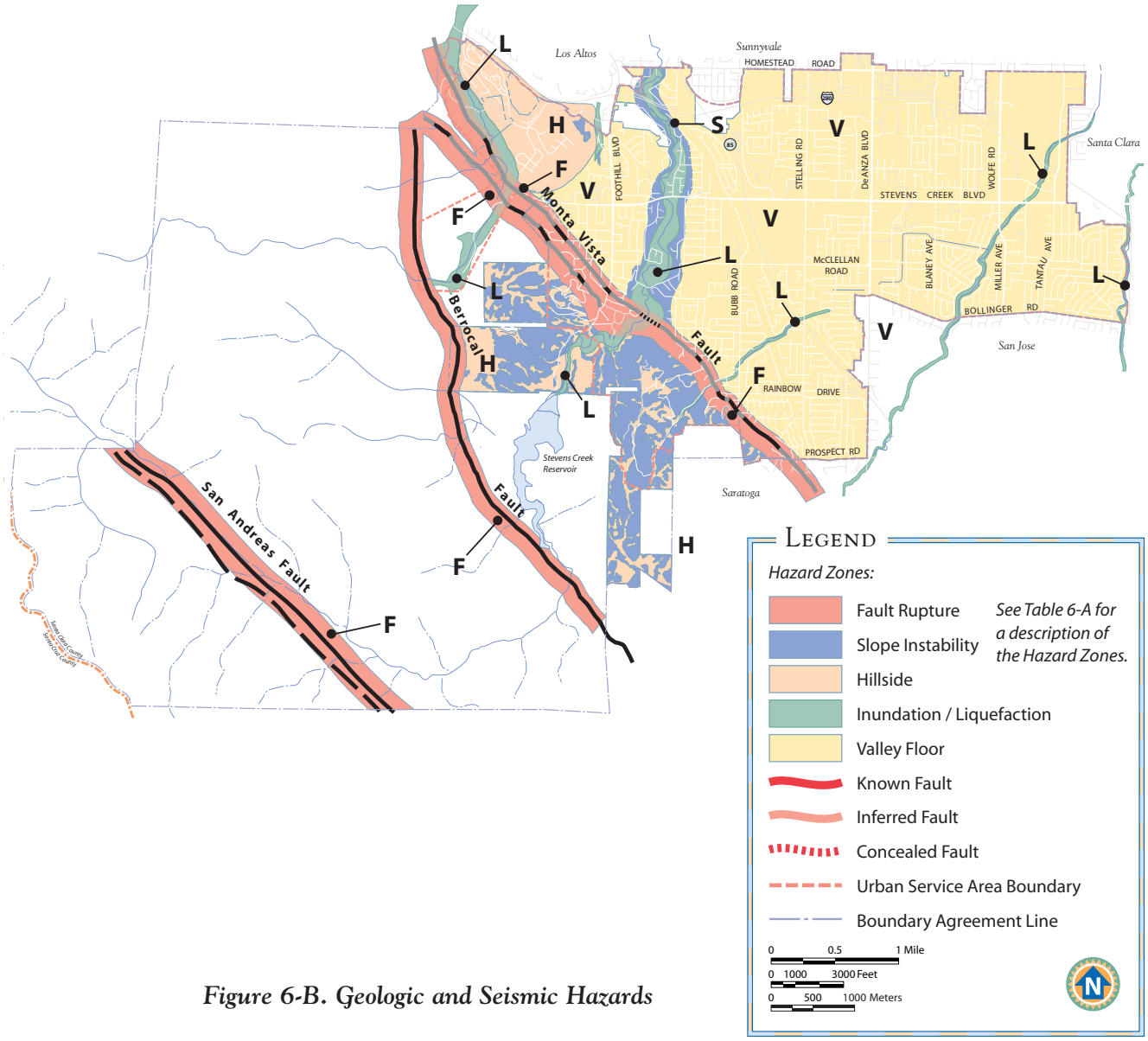


Figure 6-B. Geologic and Seismic Hazards

Figure 6-B generally depicts the location of the various known faults and hazard zones within the Cupertino planning area.

Table 6-B provides estimates of the recurrence intervals of maximum earthquakes expected for faults that would likely affect the Cupertino area. The recurrence interval on the San Andreas fault, which last ruptured in 1906, is about 220 years. Data pertaining to the recurrence intervals of large earthquakes on the Sargent-Berrocal and the Monta Vista-Shannon fault systems are less constrained. However, each year that passes without a major earthquake means that an earthquake is more likely to occur within any future year.

Table 6-B. Maximum Earthquake Magnitudes and Recurrence Intervals.

	Causative Faults	Distance from De Anza/SCB Intersection	Maximum Historic Moment Magnitude	Maximum Probable Moment Magnitude	Est. Recurrence Interval of Max. Prob. Earthquake
San Andreas System	San Andreas	5.5 Miles	7.9	7.9	220 Years
	Hayward (South)	10 Miles	7.0	7.0	236 Years
	Calaveras (Central)	14 Miles	6.2	7.0	374 Years
Sargent-Berrocal System	Sargent-Berrocal	3.5 Miles	3.7 – 5.0	6.8	330 Years
	Monta Vista – Shannon	2 Miles	2.0 – 3.0	6.8	2400 Years

Reduced Risks Associated with Geologic and Seismic Hazards

The following policies will be implemented during the development review process, as regulating new development offers the greatest rewards in risk reduction. While it is difficult to improve existing development, it is much easier to locate and design new buildings to achieve this goal.

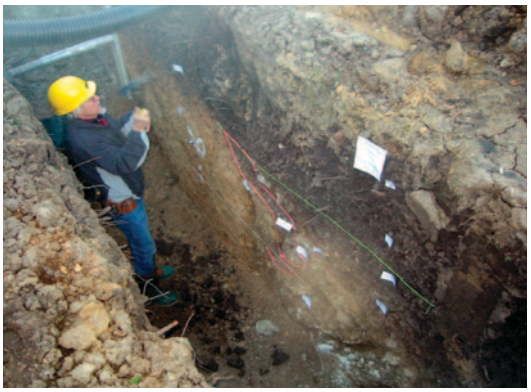
Policy 6-1: Seismic/Geologic Review Process

Evaluate new development proposals within mapped potential hazard zones using a formal seismic/geologic review process. Use Table 6-D of this Hazards Analysis to determine the level of review required.

Strategies

1. **Acceptable Level of Risk.** Encourage developers to consult with design professionals regarding performance-based design to achieve levels of safety that exceed the Uniform Building Code. The design criteria should be the maximum credible earthquake for that site. Hazardous materials use and storage facilities should aim for the highest level of seismic resistance.

2. **Geotechnical and Structural Analysis.** Require all developers to provide geotechnical analyses per the requirements of the California Seismic Hazards Mapping Act and the California Environmental Quality Act. In addition, require any site with a slope exceeding 10% to reference the Landslide Hazard Potential Zone maps of the State of California.



3. **Earthquake-Resistant Design Techniques.** Encourage new earthquake-resistant design techniques in the design and structural engineering of buildings.

4. **Residential Construction Standards Upgrade.** Review construction standards for residences to reduce earthquake damage. Examples include additional bracing for garage openings of two-story and split-level homes and increased first story bracing in multiple-family residences over parking garages. Encourage property owners to upgrade standards in these situations.

5. **Current Building Code.** Require that any residential facility that is being increased more than 50% in price, or more than 50% in size, conform to the building code then in existence throughout the entire structure. Owners of residential buildings with known structural defects, such as un-reinforced garage openings, "Soft first story" construction, unbolted foundations, or inadequate sheer walls are encouraged to take steps to remedy the problem and bring their buildings up to the current building code.

6. **Geotechnical Review Procedure.** Adopt a geotechnical review procedure that incorporates these concerns into the development review process.

It may not be practical to improve several types of buildings to incorporate revised earthquake safety standards. Fortunately, most buildings in Cupertino have been constructed in recent years and were designed under a building code that includes components and designs that resist ground shaking.

Still, structures identified as "critical facilities" should be re-evaluated, especially those in the high-hazard zones. Many seismic safety evaluations have been completed. Cupertino's schools complied with the Field Act at the time they were built. The State Department of Transportation (DOT) has a priority program to reinforce all freeways. Route 85 was built under current seismic resistance standards, and the De Anza overcrossing was redesigned to current standards when it was widened. DOTis reviewing other freeway over-crossings to determine if they need additional work. A City mandate to evaluate the structural integrity of all non-critical public or private buildings is not economically viable, but City government should educate residents, employers, and business owners to protect their property and reduce risk of injury.

Acceptable Level of Risk

Land use and building design standards must relate to the degree of geologic and seismic hazards in the zone in which a proposed project would be built so that an acceptable level of risk can be assigned. City Planning staff will work with developers to ensure that all CEQA requirements are met, and to encourage performance based design to exceed life safety only, and to seek to achieve continuing functionality of critical infrastructure and facilities where hazardous materials and hazardous wastes are used or stored.

Table 6-C. Acceptable Exposure to Risk Related to Various Land Uses.

Land uses and structural types are arranged below according to the level of exposure to acceptable risk appropriate to each group; the lowest level of exposure to acceptable risk should be allowed for Group 1 and the highest level of exposure to acceptable risk for Group 7.

Acceptable Exposure To Risk		Land Use Group	Extra Project Cost To Reduce Risk To Acceptable Level
EXTREMELY LOW	Group 1	VULNERABLE STRUCTURES (nuclear reactors, large dams, plants manufacturing/ storing hazardous materials)	As required for maximum attainable safety
	Group 2	VITAL PUBLIC UTILITIES, (electrical transmission interties/substantions, regional water pipelines, treatment plants, gas mains)	Design as needed to remain functional after max. prob. earthquake on local faults
	Group 3	COMMUNICATION/TRANSPORTATION (airports, telephones, bridges, freeways, evac. routes)	5% to 25% of project cost
		SMALL WATER RETENTION STRUCTURES	Design as needed to remain functional after max. prob. earthquake on local faults
		EMERGENCY CENTERS (hospitals, fire/police stations, post-earthquake aide stations, schools, City Hall and Service Center, De Anza College)	
	Group 4	INVOLUNTARY OCCUPANCY FACILITIES (schools, prisons, convalescent and nursing homes)	
		HIGH OCCUPANCY BUILDINGS (theaters, hotels, large office/apartment bldgs.)	
MODERATELY LOW	Group 5	PUBLIC UTILITIES, (electrical feeder routes, water supply turnout lines, sewage lines)	5% to 25% of project cost
		FACILITIES IMPORTANT TO LOCAL ECONOMY	Design to minimize injury, loss of life during maximum probable earthquake on local faults; need not design to remain functional
ORDINARY RISK LEVEL	Group 6	MINOR TRANSPORTATION (arterials and parkways)	2% of project cost; to 10% project cost in extreme cases
		LOW-MODERATE OCCUPANCY BUILDINGS (small apartment bldgs., single-fam. resid., motels, small commercial/office bldgs.)	
	Group 7	VERY LOW OCCUPANCY BUILDINGS	Design to resist minor earthquakes (warehouses, farm structures) w/o damage; resist mod. Earthquakes w/o struc. damage,with some non-struct. damage; resist major earthquake (max. prob. on local faults) w/o collapse, allowing some struc. & non-struc. damage
		OPEN SPACE & RECREATION AREAS (farm land, landfills, wildlife areas)	

Table 6-D. Technical Investigations Required based on Acceptable Risk.

Land Use Activity	Hazard Zone Map Symbol	
	F S H	L V
	Evaluation Required	Evaluation Required
Groups 1 to 4	UBC Soils Geology Seismic Hazard	UBC Soils Seismic Hazard
Groups 5 to 7	UBC Soils Geology	UBC Soils

Descriptions of Technical Evaluations:

UBC 1997 (or latest City adopted) Edition, Uniform Building Code

Soils Soils and foundation investigation to determine ability of local soil conditions to support structures

Geology Determine subsidence potential, faulting hazard, slope stability (See Geologic Hazards Map for additional detail)

Seismic Hazard Detailed Soils/Structural evaluation to certify adequacy of normal UBC earthquake regulations or to recommend more stringent measures

Table 6-D shows a policy position on the amount of technical evaluation needed to ensure that hazards in new developments are reduced to an acceptable level of risk based on land use. Critical facilities in Cupertino's planning area should be evaluated and modified structurally to withstand a maximum earthquake.

The State of California and its local governments have developed a variety of building codes to prevent loss of life in the maximum, credible earthquake. It is the policy of the City of Cupertino to endorse performance based design of all structures to encourage functionality after the maximum, credible earthquake. While every earthquake is unique, and the specific shaking intensity at a given site cannot be exactly predicted, facilities that relate to the provision of essential health and safety services should be designed and built to achieve post-earthquake functionality.

Policy 6-2: Public Education on Seismic Safety

Reinforce the existing public education program to help residents reduce earthquake hazards.

Strategies

1. **Covenant on Seismic Risk.** Require developers to record a covenant to tell future residents in high-risk areas about the risk and inform them that more information is in City Hall records. This is in addition to the State requirement that information on the geological report is recorded on the face of subdivision maps.

2. **Emergency Preparedness.** Publish and promote emergency preparedness activities and drills. Use the Cupertino Scene and website to provide safety tips that may include identifying and correcting household hazards, knowing how and when to turn off utilities, helping family members protect themselves during and after an earthquake, recommending neighborhood preparation activities, and advising residents to maintain an emergency supply kit containing first-aid supplies, food, drinking water and battery operated radios and flashlights.

3. **Neighborhood Response Groups.** Encourage participation in Community Emergency Response Team (CERT) training. Train neighborhood groups to care for themselves during disasters. Assist in neighborhood drills.

4. **Dependent Populations.** Actively cooperate with State agencies that oversee facilities for vulnerable populations, to ensure that such facilities conform to all health and safety requirements, including emergency planning, training, exercises and employee education.

5. **Foreign Language Emergency Information.** Obtain translated emergency preparedness materials and make them available to appropriate foreign language populations.

Santa Clara County Fire Station, Stevens Creek Boulevard

FIRE HAZARDS

The City of Cupertino endeavors to provide its citizens with fire and emergency services of the highest standards. This makes Cupertino an attractive and safe place in which to live and do business.

Cupertino's geographical boundaries extend from the lower foothills of the Santa Cruz Mountain Range at its westerly limits to the urbanized valley floor at its northerly, easterly and southerly limits. For this reason, Cupertino is exposed to hazards from both wild and urban fires. These two types of fire hazards have their own unique characteristics and present different fire-fighting problems. Wild fires are a threat to residents living in the rural areas of the foothills. If not contained, wild fires can have a devastating effect on a community, causing injuries and consuming vegetation and structures in their path. Urban fires pose other problems. They may include fires in high–rise buildings, multiple residential structures, or fires in commercial and industrial buildings where highly flammable and toxic materials may be stored.

Fire fighting and emergency medical services are provided to the City of Cupertino by the Santa Clara County Fire

Department (SCCFD) (formerly known as the Santa Clara County Central Fire Protection District). The Santa Clara County Fire Department is a full service department, which provides similar services to seven other west valley cities and adjacent County areas. Mutual aid agreements with the neighboring jurisdictions augment the SCCFD's fire response capabilities, and the City of Cupertino is a beneficiary of these expanded capabilities.

In addition to fire protection, the SCCFD also conducts fire prevention inspections and educational programs, including those on Community Emergency Response Team (CERT) training, cardio-pulmonary resuscitation (CPR) and first aid certification

Cupertino's growth over the next 20 years will be accommodated within Cupertino's existing urban service area, and there will not be a need to expand the existing service area. This new growth, however, may generate greater demands on the existing fire services. A needs assessment may have to be conducted by the SCCFD to determine the ability to continue to provide the same level of service.

The City's and the SCCFD'S common goal is to maintain a high level of service. One of the most important measurements in the level of service is response time. Response time is critical for life safety and for minimizing property damage. It is the policy of the SCCFD to respond to 90% of emergency calls in under five minutes.

A radius of one and one-half miles is considered to be the ideal service area for a fire station. However, this is not necessarily an absolute standard because there could be conditions that may affect the radius of the service area, e.g., an area developed with large number of commercial and industrial buildings may require a service area of only three quarters of a mile radius, while for a rural environment of single-family and two-family houses a service area of three to four miles, or more, may be acceptable. Figure 6-C, Fire Service Area Boundaries Map shows the distances from the three SCCFD fire stations.

The map illustrates that the major portion of the community is within a one and one-half mile radius from a fire station. These distances determine potential response time; however, sometimes response time may be affected by traffic congestion and other problems.

One of the major goals of fire service is to reduce response time, but this goal may sometimes conflict with City policies, e. g., the City's policy of discouraging commute traffic from driving through neighborhoods may delay response time by making it difficult for fire equipment to use direct routes. The use of private security systems, such as electronically operated entry gates, for planned residential communities may also delay response time. The use of these security measures must be looked at carefully.

An increase in calls for fire service and traffic congestion can also erode the Fire Department's critical response time. To compensate, the Fire Department may need to adjust and/or expand staff and equipment in areas of high service demand and continue its program for placing emergency traffic preemption controls at key traffic signals.

Potential Fire Hazards

Fire Hazards in the Foothills and Mountains

People who live in the foothills and

Fire Service

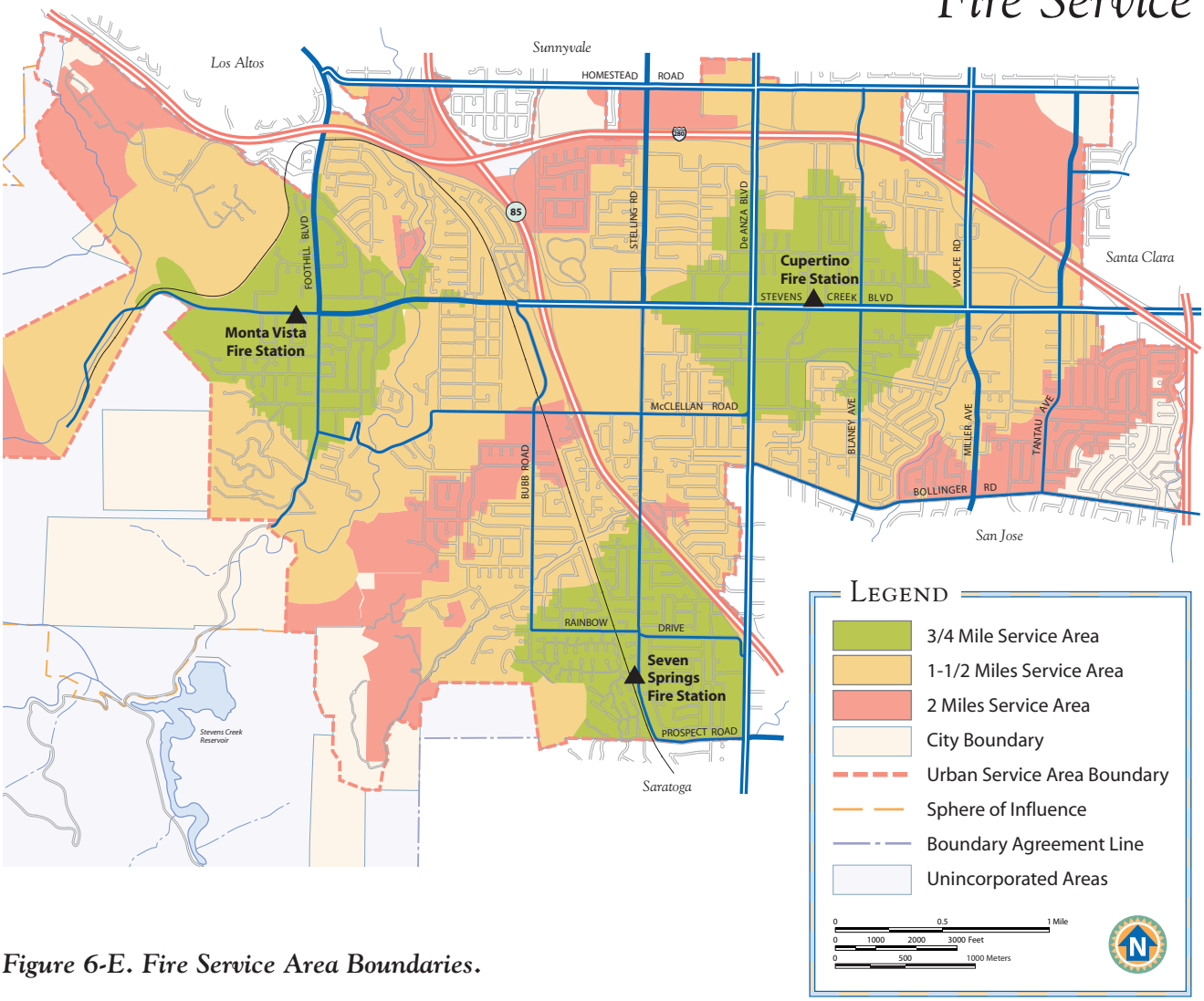


Figure 6-E. Fire Service Area Boundaries.

mountains of Cupertino's planning area are most at risk from fire. The City is not directly involved in fire fighting in the mountains, but fire safety in the Montebello Ridge and Stevens Canyon area is of extreme importance to Cupertino. Major fires in this area could harm the Stevens Creek watershed by increasing flooding potential, silting up streambeds and reducing recreational opportunities.

The vegetative cover, the degree of slope and critically dry weather conditions are the three natural factors the California Division of Forestry uses to classify the severity of potential fires in the foothills. Development in the foothills is typically low density and scattered throughout the area, making fire protection difficult. The degree of hazard to life and property in these areas is affected not only by the fire itself but also by other factors, such as, access roads for firefighting and evacuation, the available strength of fire fighting force, the availability of water to fight the fire and the effectiveness of building codes and inspection of developments in the fire hazards areas.

There are about 16 square miles of land in the mountains of the Cupertino planning area. Any increase in density raises the exposure to fire risks. In 1992, all properties above the 10% slope line were categorized as Hazardous Fire Areas, i.e., land that is covered with grass, brush or forest, and which is also difficult to access. Structures within this area are required to have fire retardant (Class A) roofing, and property owners are required to continuously clear any brush away from their structures. Such structures are also required to have sprinklers. If a fire were to start in this area, it would be abnormally difficult to suppress.

Most of the mountainous land is owned by either the Midpeninsula Regional Open Space District or the Santa Clara County Parks System. When the parks are fully active, many people could be exposed to fire risk.

EFFICIENT AND EFFECTIVE FIRE AND EMERGENCY SERVICES TO PROTECT THE COMMUNITY FROM HAZARDS ASSOCIATED WITH WILD AND URBAN FIRES

Policy 6-3: Wild Fire Prevention Efforts

Coordinate wild fire prevention efforts with adjacent jurisdictions.

Policy 6-4: County Fire Hazard Reduction

Encourage the County to put into effect the fire reduction policies of the County Public Safety Element.

Policy 6-5: Fuel Management to Reduce Fire Hazard

Encourage the Midpeninsula Open Space District and the County Parks Department to continue efforts in fuel management to reduce fire hazards.

Policy 6-6: Green Fire Breaks

Encourage the Midpeninsula Open Space District to consider "green" fire break uses for open space lands.

Fire Hazards in the Urbanized Valley Floor

Most people who live and work in the urbanized areas of Cupertino are not exposed to a high risk of fire. The City is served by a well-managed fire protection service as well as a fire prevention program. Buildings in the City are relatively new and there is a strong code enforcement program, an adequate water supply and a well-maintained delivery system. However, there are some geographical areas in the City to which more attention could be directed to reduce potential fire hazards. In urban areas the most serious concern is fires in high-rise, multiple-family dwellings and commercial and industrial structures containing highly combustible or toxic materials.

FIRE PREVENTIVE MEASURES THAT MINIMIZE THE LOSS OF LIFE AND PROPERTY

Policy 6-7: Early Project Review

Involve the Fire Department in the early design stage of all projects requiring public review to assure Fire Department input and modifications as needed.

Policy 6-8: Commercial and Industrial Fire Protection Guidelines

Coordinate with the Fire Department to develop new guidelines for fire protection for commercial and industrial land uses.

Policy 6-9: Fire Prevention and Emergency Preparedness

Promote fire prevention and emergency preparedness through city-initiated public education programs, through the government television channel, the Internet and the Cupertino Scene.

Policy 6-10: Multi-Story Buildings Fire Risks

Recognize that multi-story buildings of any land use type increase risks of fire. Ensure that adequate fire protection is built into the design and require on-site fire suppression materials and equipment to ensure the safety of the community.

Policy 6-11: Residential Fire Sprinklers Ordinance

Consider adopting a residential fire sprinkler ordinance. This will reduce fire flow requirements.

Policy 6-12: Smoke Detectors

Require smoke detectors in all new residential units, and in all residential units at time of sale or rental, in conformance with State law. Continue to Use the Cupertino Scene to publicize fire hazards correction methods.

Policy 6-13: Wood Shake Roof Abatement

Adopt an aggressive wood shake roof abatement program to require that any roof that is 25% or more replaced must use fire retardant materials for all replacement shakes. Wood shake roofs have been outlawed in California because of their likelihood to catch fire from external sources, such as burning embers from chimneys. The law already requires fire resistant shakes on any roof that is 50% or more repaired or replaced.

Building Codes, Fire Codes and other Regulations

To minimize potential fire hazards, the City of Cupertino regulates building construction and site planning through the Uniform Fire Code and the Uniform Building Code. Cupertino's large commercial and industrial buildings are designed with substantial areas of open space around them to preclude the spread of fire. The City also requires automatic sprinklers and fire detection systems to further reduce risks.

In addition, the City and the Fire Department periodically inspect commercial and industrial buildings for compliance with the applicable codes. Single-family homes do not require inspection, but smoke alarms are required in all new homes constructed in the City. The City also supports the retrofitting of existing homes with smoke detectors

Under the Uniform Fire Code, undeveloped or sparsely developed areas possessing characteristics for potentially high fire risk may be designated hazardous fire areas. In such areas, the Code regulates building materials, planting material and clearances between structures and planting material. The County Fire Marshal and the Fire Department regulate activities in the fire hazard area, and have the authority to deny access to the public to any area if

they determine it is in the interest of public safety. They also administer the Weed Abatement and Brush Clearance Ordinance in the hazardous fire areas. The purpose of this Ordinance is to minimize the potential of transference of brush fires and to reduce the potential accidental fires.

The City of Cupertino has a good safety record in terms of fire protection and a minimum of fire losses. This record is reflected in the City's excellent fire insurance rating of Class 2 (Class 1 is considered a perfect rating). This low level of risk is the combined result of the high proportion of new construction which meets current Uniform Building Code standards, and efficient fire protection service.

Constraints to Firefighting

Access Roads

Access is a critical component of fire safety. Fire fighting equipment must be able to reach the location of the fire as quickly as possible. Likewise, viable means must be provided for residents and visitors alike to escape the dangers of a fire.

Public road access is severely limited in the hillside rural areas. Emergency access roads run through private property and these property owners are asked to act independently or collectively to maintain fire access roads. Fire equipment needs roads that are passable, have less than 16% grade, a minimum turning radius of 42 feet and sufficient space to turn around.

Santa Clara County lists the Montebello Road/Stevens Canyon area as the fourth highest risk in the County. The road linking Montebello and the Palo Alto Sphere of Influence to the bottom of Stevens Canyon has been improved to acceptable standards as a fire access road. A fire trail extends from Skyline Boulevard on Charcoal Road to Stevens Canyon.

Road accessibility in the lower foothills is easier. The City requires that all-emergency roads be constructed with an all weather surface. It also requires a private emergency access connection between public streets within Lindy Canyon and Regnart Canyon. However, private roads are less likely to meet the access standards. Private roads are not required to be constructed to City standards and, therefore, are usually built to lesser standards than public roads. Moreover, there are no long–term guarantees that they will be maintained.

Dead end roads are risky, especially those long dead end roads that give access to many portions of Regnart Road and Stevens Canyon areas. For this reason, alternate access routes are provided via private emergency access routes.

GOAL D

An all weather emergency road system to serve the rural areas

Policy 6-14: Roadway Design

Involve the Fire Department in the design of public roadways for review and comments. Attempt to ensure that roadways have frequent median breaks for timely access to properties.

Policy 6-15: Dead-End Street Access

Allow public use of private roadways during an emergency for hillside subdivisions that have dead-end public streets longer than 1,000 feet or find a secondary means of access.

Policy 6-16: Hillside Access Routes

Require new hillside development to have frequent grade breaks in access routes to ensure a timely response from fire personnel.

Policy 6-17: Hillside Road Upgrades

Require new hillside development to upgrade existing access roads to meet Fire Code and City standards.

Access to Residential Developments

Fire and other emergency personnel may be impeded if there are vehicular electronic security gates on residential developments. Therefore, vehicular electronic security gates should be discouraged unless they comply with the General Plan and receive a fence exception. All vehicular electronic security gates should meet the requirements of the emergency service agencies, and attempts should be made to standardize access.

Policy 6-18: Private Residential Electronic Security Gates

Discourage the use of private residential electronic security gates that act as a barrier to emergency personnel.

Strategies

1. **Fence Exception:** Require a fence exception for electronic security gates. 1

2. **Access to Gates.** Where electronic security gates are allowed, require the installation of an approved key switch.

1 See Chapter 16.28 of the Cupertino Municipal Code

Water Availability

Assuring water availability to the more remote areas in and around Cupertino is important to achieving a safe community.

Water Supply on Montebello Ridge and Stevens Canyon

Presently, there are no water systems serving the Montebello Road and upper Stevens Canyon area, with the exception of Stevens Creek itself. Because there is no water service to these areas, the County requires that each homesite be served by its own individual 10,000-gallon tank and that a sprinkler system be installed. Theoretically, it is possible to have a jointly owned and operated water storage system to reduce the required amount of on-site storage of water for each individual property, provided an adequate water main distribution system to serve all homes sharing the joint facility is in place. However, the maintenance and operation costs of such a system could impose an economic burden on the homeowners if there were not enough properties within the system to make the individual share for defraying the costs reasonable. Former private systems in the area proved to be unsuc-

cessful and were ultimately annexed to the major water providers in the area.

Water Supply for Foothill Regions within the Urban Service Area

All development in the Urban Service Area must be served by a water system that complies with City standards for household and firefighting use.

Presently, a few developed areas, such as lots in the upper reach of Regnart Canyon and a few areas in Inspiration Heights, do not have an adequate water system. However, in the long-term, these areas may receive a better supply of water for fighting fires, as the water system is extended to serve new development in the area and the water providers in the area expand their service area to serve new growth in the area.

GOAL E

Available Water Service in the Hillside and Canyon Areas

Policy-6-19: Extension of Water Service

Encourage the water companies to extend water service into the hillside and canyon areas.

Policy 6-20: Growth Cooperation

Encourage cooperation between water utility companies and the Fire Department in order to keep water systems in pace with growth and firefighting service needs.

Policy 6-21: Fire Fighting Upgrades Needs

Encourage utilities to consider Fire Department firefighting needs when upgrading water systems.

Water Supply for Foothill Regions

Accessibility and availability to an adequate supply of water is extremely important in firefighting. The City of Cupertino is served by two water retailers, which also serve the foothill areas: the San Jose Water Company, which leased the Cupertino Municipal Water System and annexed the Reglin Mutual Water System, and the California Water Company (see Figure 6-D). Together these two systems have adequate water lines and distribution systems to meet the fire flow needs. However, although they meet the present needs, neither private water system is required to maintain an adequate fire flow under their agreements with the City and fire agencies.

The City of Cupertino has taken a number of steps to combat fire hazards. It adopted the current State Fire Code, and declared most of the Santa Cruz Mountain range as hazardous fire areas. It has also adopted the following preventive measures: 1) An early review process with the Fire Department and the City is conducted to incorporate fire prevention methods. 2) the City reviews building plans and requires use of fire resistant materials. 3) The City also coordinates with and encourages the County of Santa Clara to uphold the weed abatement program.

Water Service

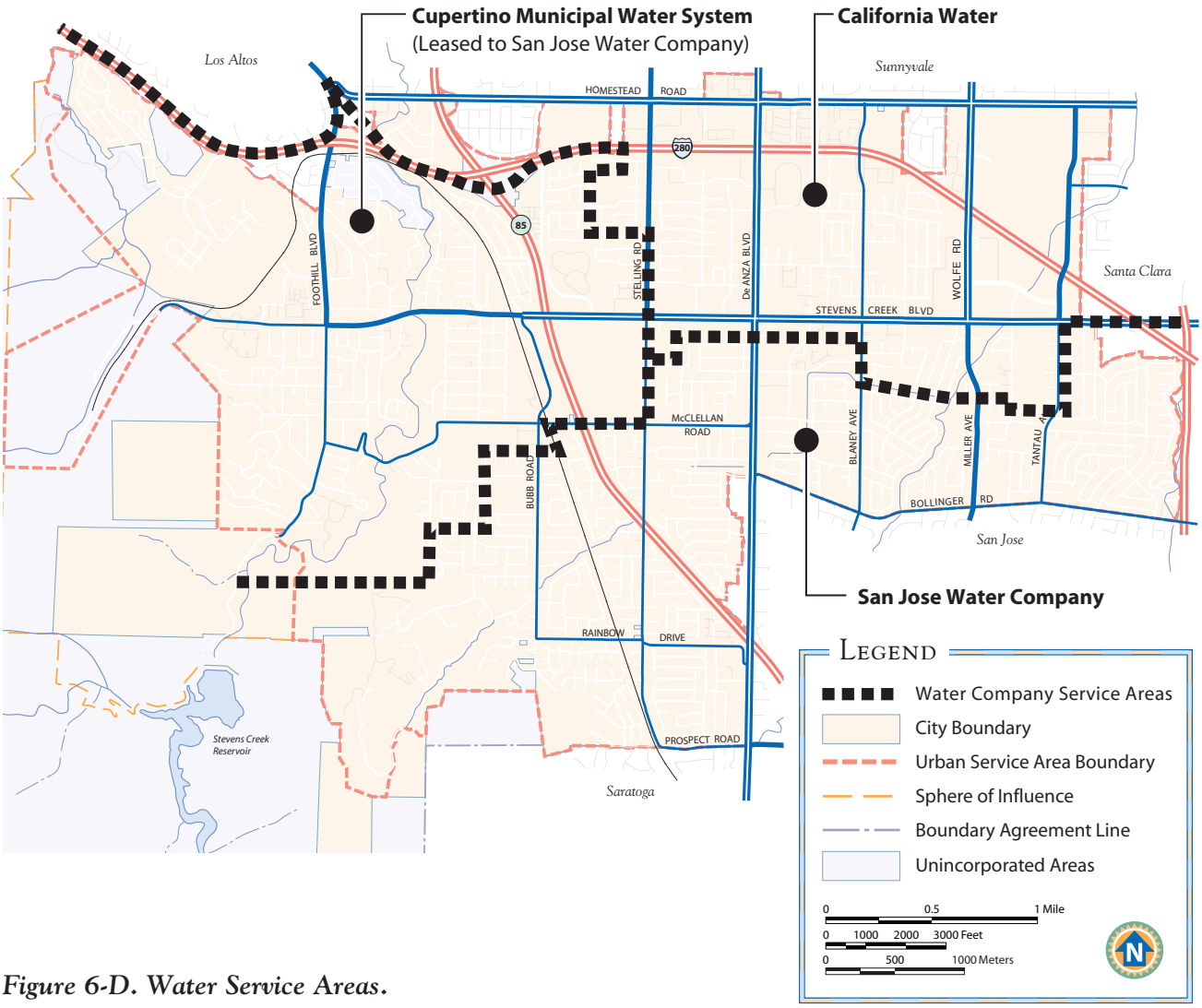


Figure 6-D. Water Service Areas.

Policy 6-22: Residential Fire Sprinklers

Require fire sprinklers in new residential construction located in hillside areas and flag lots.

CRIME AND POLICE SERVICES

The sociological climate of a community is of extreme importance to its viability as a desirable place to live and work. Residents must be able to carry out their routine activities and enjoy the community's assets in an environment free of worries about their well being. Businesses must also

feel comfortable and secure in the conduct of their activities and ensured that their investments are protected.

The City's commitment to public safety encompasses two broad areas of responsibilities: 1) to provide public safety services and the planning necessary for the prevention of crime, and 2) to plan for a safe environment in which the public is not exposed to unnecessary risks to life an property. Cupertino has a very low crime rate, which can be partially attributed to project design techniques and active community involvement. However, changes in future development patterns and an increase in both employment and housing opportunities may affect public safety. An expansion in the retail sector may increase opportunities for thefts and other related criminal activities. An increase in growth may also result in additional vehicular traffic, which increases the risk of automobile accidents. These future changes may reflect a need for additional public safety services.

The City recognizes the sociological and psychological effects of the physical environment on human behavior and conducts pre-hearing review meetings for all new projects. This occurs early in the planning process and involves the Santa Clara County Sheriff Department, commenting on safety issues. In addition to this early involvement in the planning process, the Santa Clara County Sheriff Department provides Cupertino with a full spectrum of police services, which include: police patrol services, criminal investigation, traffic enforcement, accident investigation and tactical teams.

Park Design

Neighborhood and Community Parks provide open space and recreational opportunities for Cupertino's families. Open space offers a respite from the busy urban environment and present opportunities for people to engage in physical recreational activities. However, parks must safe to be enjoyed. Families must be free of worry about the well being of both adults and children who use the facilities.

Future parks will be designed by using the principles of "defensible space." They will be easily accessible from streets, where feasible, to allow neighbors and the police maximum visibility into the park from the peripheral areas. They will also take into consideration design techniques to minimize potential vandalism and crime.

Residential Design for Defensible Space

Cupertino's General Plan stresses protection of visual privacy. This could conflict with the concept of "defensible space," if privacy design techniques isolate households enough so that people feel they are losing private and semi-private spaces in residential developments. Design can also be used to create social cohesion, important not only for a planned residential community, but in single-family detached homes as well. Cupertino actively supports a Neighborhood Watch Program that offers advice on crime prevention and encourages neighborhood cohesiveness.

Non-Residential Design for Defensible Space

Using design techniques to prevent crime in non-residential districts is more prevalent than in residential areas. The key is to design buildings to ease police patrol and help community surveillance. Decisions on

crime prevention involve tradeoffs between aesthetics and the ease of access for patrol vehicles, as well as tradeoffs between privacy and acoustical protection between commercial properties and adjacent homes.

Commercial office and industrial properties designed with interior garden courts, with private fenced patios and isolated entrances, have more burglaries and robberies than those that are highly visible. Masonry barriers, earth mounds and landscaping beds are typically used to isolate parking lot noise in commercial operations. The County Sheriff's Office believes that these solutions do not increase burglary in adjoining homes.

HIGH QUALITY POLICE SERVICES THAT MAINTAIN THE COMMUNITY'S CRIME RATE LOW AND ENSURE A HIGH LEVEL OF PUBLIC SAFETY

Policy 6-23: Neighborhood Awareness Programs

Support the Neighborhood Watch Program and others intended to help neighborhoods prevent crime through social interaction.

Policy 6-24: Public Perimeter Roads for Parks

Encircle neighborhood parks with a public road to provide visual accessibility whenever possible.

Policy 6-25: Crime Prevention in Building Design

Consider the relationship between building design and crime prevention in reviewing all developments.

Policy 6-26: Fiscal Impacts

Recognize fiscal impacts to the County Sheriff and City of Cupertino when approving various land use mixes.

Policy 6-27: Pre-hearing Review

Continue to request County Sheriff review and comment on development applications for security measures.

HAZARDOUS MATERIALS

Hazardous materials pose a danger to public health and safety. They encompass a broad range of substances, including materials that are toxic, flammable, explosive or corrosive. Yet these materials are recognized as an integral part of society, used to produce manufactured goods that contribute to our economic well being and quality of life.

Hazardous materials are used in manufacturing processes in Santa Clara County and are also part of our everyday life in the form of household chemicals, such as pesticides, motor oil, cleaners and paints. The use, storage and disposal of hazardous materials, including management of contaminated soils and groundwater are regulated by federal, state and local laws and regulations. The transportation, distribution, storage and disposal of hazardous materials is of great concern to Cupertino. The City has adopted a Hazardous Materials Ordinance that regulates the storage of these materials in solid and liquid form. The City's Toxic Gas Ordinance regulates the storage of these materials that are in gaseous form.

ELECTROMAGNETIC FIELDS (EMF)

Over the past 20 years, concern has been expressed about the potential effects associated with electromagnetic fields from such sources as transmission lines, electrical facilities, antennae and appliances.

A number of studies have been conducted to determine potential links between EMF levels and their effects on health. Many of these studies have been controversial and inconclusive, and experts have not agreed on a definitive answer, although many in the international community now consider EMF to be a possible human carcinogen, relating exposure to elevated magnetic fields to a small increase in the risk of childhood leukemia. Although the potential effects of EMF on health have not been conclusively demonstrated, it is recommended that the planning review process be expanded to include a review of potential EMF sources to ensure that their effects, if any, could not impact residential developments or child care facilities.

GOAL G

PROTECTION FROM THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS AND EXPOSURE TO ELECTROMAGNETIC FIELDS

Policy 6-28: Hazardous Materials Storage and Disposal

Require the proper storage and disposal of hazardous materials to prevent leakage, potential explosions, fire or the release of harmful fumes.

Policy 6-29: Proximity of Residents to Hazardous Materials

Assess future residents' exposure to hazardous materials when new residential development of childcare facilities are proposed in existing industrial and manufacturing areas. Do not allow residential development if such hazardous conditions cannot be mitigated to an acceptable level of risk.

Policy 6-30: Electromagnetic Fields

Consider potential hazards from Electromagnetic Fields in the project review process.

HAZARDOUS WASTE

In the past, the managing of hazardous waste has relied heavily upon land disposal of untreated hazardous wastes. This approach sometimes led to the contamination of both soil and groundwater and is now prohibited. Since 1990, State law has required that hazardous waste must be properly disposed of in approved hazardous waste treatment or disposal facilities. To accomplish this, new treatment methods and facilities had to be developed and approved to pre-treat hazardous waste before its final disposal

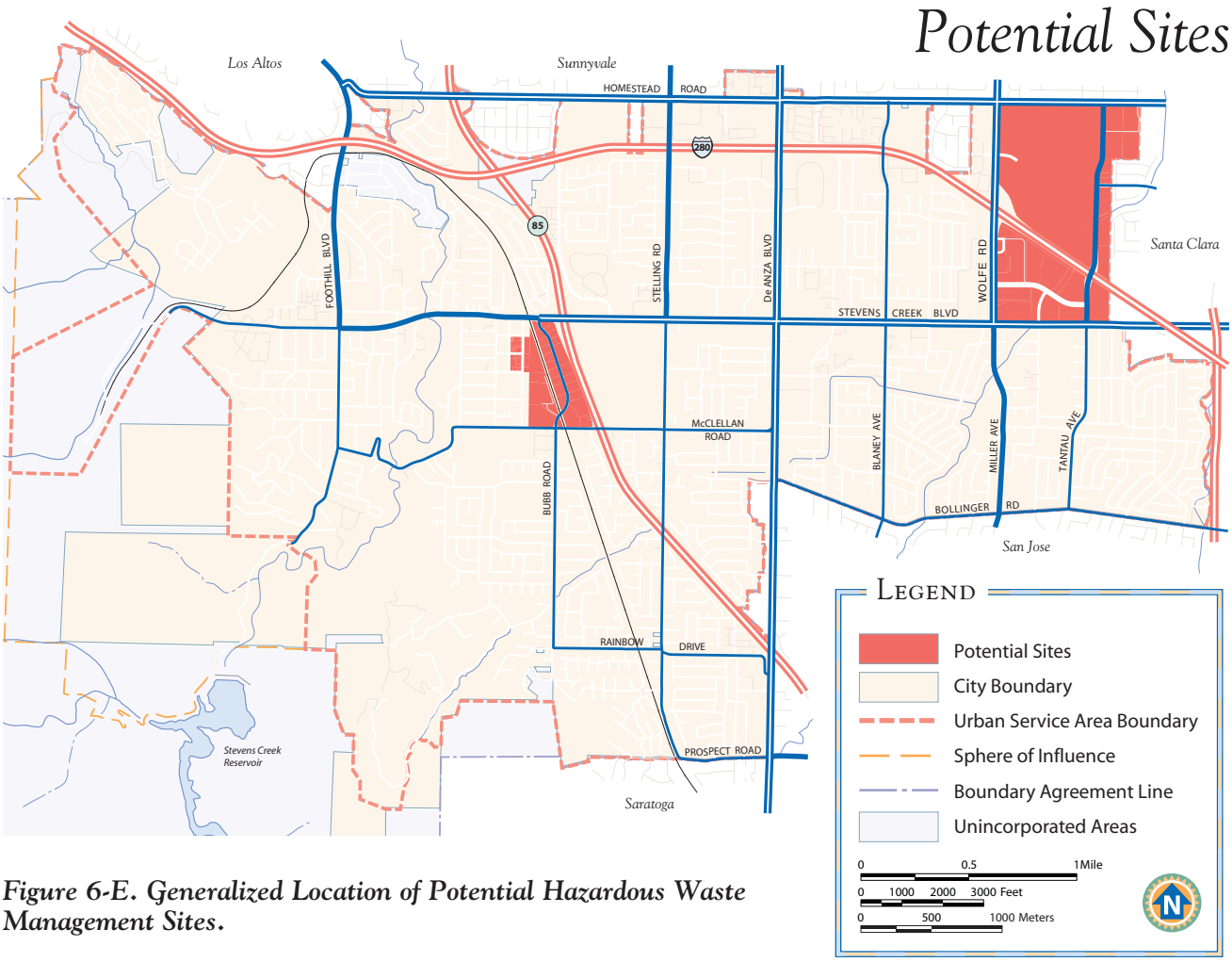


Figure 6-E. Generalized Location of Potential Hazardous Waste Management Sites.

Under authority of the 1986 "Tanner" Bill (AB2948), Cupertino, along with 13 other cities, joined the County to jointly develop a comprehensive and coordinated planning approach to hazardous waste disposal. The County's Hazardous Waste Management Plan (CoHWMP) was endorsed by the Cupertino City Council in 1990.

The CoHWMP directed the County to work with the cities to develop a program to provide residents and small businesses the opportunity to properly dispose of hazardous waste. In 1990, the County and the cities created a county-wide Household Hazardous Waste Program, in which Cupertino participates.

Policy 6-31: Alternative Products

Encourage residents and businesses to use non- and less-hazardous products, especially less toxic pest control products, to slow the generation of new hazardous waste requiring disposal through the county-wide program.

Policy 6-32: Household Hazardous Wastes

Support and help fund the County-wide Household Hazardous Waste Program, to provide residential and small business communities the opportunity to properly dispose of hazardous waste.

Strategy

Educational Materials. Publish educational materials about the program in the Cupertino Scene, website and in brochures that are distributed throughout the community.

Policy 6-33: Hazardous Waste Dumping

Inform the residential and business communities about the illegality and danger of dumping hazardous material and waste in the storm drain system or in creeks.

Strategy

Code Enforcement. Enforce illegal dumping through code enforcement personnel.

The City is required to identify generalized locations where hazardous waste management facilities could be placed. Figure 6-G on page 32 describes these generalized industrial locations, but does not necessarily ensure that any particular treatment/disposal facility could be placed in the locations consistent with siting criteria in the County or City HWMP.

Facilities that could typically be placed on sites of the scale available in Cupertino would generally emphasize reclamation or recycling of waste products. However, other TSD (Transfer, Storage or Disposal) facilities could include equipment for stabilization of liquid or gaseous contaminants prior to ultimate disposal outside the City, facilities for reduction or oxidation of compound materials from temporary to permanent storage containers.

There are no sites in Cupertino suitable to the development of a residuals repository facility, due to the large-scale site requirements and region-serving nature of such facilities.

DISASTER PLANNING

Disaster Planning is a continuous cycle of preparation, response, recovery and mitigation. Emergency Management attempts to incorporate these ideas into each of its functional elements: emergency planning, coordination, training and public education.

State law requires that cities prepare an emergency plan to respond to natural or human-caused disasters that threaten the lives, property or environment of the community. The Cupertino Emergency Plan establishes an organizational framework to enable the City to manage its emergency response activities and to coordinate with county, state and federal agencies.

GOAL J

A HIGH LEVEL OF EMERGENCY PREARED-NESS TO COPE WITH BOTH NATURAL OR HUMAN-CAUSED DISASTERS

Policy 6-34: Promote Emergency Preparedness

Distribute multi-hazard emergency preparedness information for all threats identified in the emergency plan. Information will be provided through Cardio-Pulmonary Resuscitation (CPR), First Aid and Community Emergency Response Team (CERT) training, lectures and seminars on emergency preparedness, publication of monthly safety articles in the Cupertino Scene, posting of information on the Emergency Preparedness website and coordination of video and printed information at the library.

The Cupertino Emergency Plan

The City's Emergency Plan has been prepared in accordance with the National Incident Management System (NIMS) and is used in conjunction with the State Emergency Plan, the Santa Clara Operational Area Interim Agreement, Santa Clara County Emergency Plan, as well as plans and SOPs of contract agencies and special districts." Within this system, the City Manager is the Director of Emergency Services when a local emergency exists. Support personnel such as City Staff, representatives from Public Safety, special districts and volunteer groups are trained to perform specific functions in the Emergency Operations Center. These functions include Management, Operations, Logistics, Planning/Intelligence and Finance.

There are two parts to the Emergency Plan. The first part includes legal requirements and program explanations. The second part addresses the functional responsibilities and checklists of the representatives of the Emergency Operations Center. The plan is reviewed annually and tested through annual disaster drills.

City Employees as Disaster Service Workers

During emergencies, all City employees are designated Disaster Service Workers, under Section 3100 of the California Government Code, and are required to remain at work as long as they are needed. To help prepare for this additional responsibility, all employees receive training in personal and home preparedness, First Aid, CPR, NIMS and Terrorism Awareness. The City provides opportunities for employees to purchase discount preparedness supplies and offers additional free disaster training through the Community Emergency Response Team program.

Policy 6-35: Emergency Service Training Program

Train employees in disaster preparedness, first aid and CPR.

Strategy

Conduct Exercises. Conduct exercises regularly to update employee training.

Volunteers as Disaster Service Workers

Under the Emergency Preparedness Plan volunteer groups play an important role by providing specific services. The City is part of a countywide volunteer services plan. The Emergency Services staff is working with the Volunteer Center of Silicon Valley to develop a plan for coordinating and deploying volunteers. Pre-disaster volunteers, such as NIMS and CARES members, have received appropriate training and equipment to rapidly augment professional disaster workers. Unregistered and untrained volunteers may be assigned under the supervision of city staff as needed during a disaster.

Policy 6-36: Responsibilities of Volunteer Groups

Clearly define responsibilities of volunteer groups during a local emergency.

Strategies

1. **Community Groups.** Develop pre-disaster agreements with appropriate community groups to provide specified post-disaster assistance, through the Emergency Services Coordinator and with the advice of the City Attorney.

2. **American Red Cross.** Implement the American Red Cross agreements under the direction of the Director of Emergency Services (City Manager) during a disaster. The American Red Cross is the Congressionally mandated mass care and shelter provider in the United States. The Santa Clara Valley Chapter of the American Red Cross has existing agreements with all secondary school districts in the county for the use of their facilities as mass care and shelter facilities during any locally declared disaster.

3. **Shelter Providers.** Prepare an agreement with designated shelter sites to provide space for emergency supply containers.

Amateur Radio Operators

Cupertino Amateur Radio Emergency Service (CARES) coordinates extensive city-wide communications capability and connects neighbors, public safety, special districts, City and County Departments. CARES is a volunteer organization and space is provided for their operating equipment in the City EOC and alternate EOC.

Policy 6-37: Amateur Radio Operators

Continue to support training and cooperation between the City and Cupertino Amateur Radio Emergency Service (CARES) to prepare for emergency communications needs.

Emergency Operations Center

The Emergency Operations Center (EOC) is located on the lower floor of City Hall. It is designed to be fully functional within 30 minutes of activation. Capabilities include emergency backup power, computer network, internet access and telephone and radio communications to City and County sites. Additional communication support is provided by volunteers from Cupertino Amateur Radio Emergency Service (CARES). The alternate Emergency Operations Center is located at the Service Center on Mary Avenue.

Policy 6-38: Emergency Operations Center

Train identified city employees on their functions/responsibilities in the EOC.

Community Preparedness

Keep the community well informed and prepared on how to cope with catastrophic events.

Policy 6-39: Emergency Public Information

Develop and maintain an Emergency Public Information program to be used during emergency situations.

Strategies

1. **Communication Methods.** Use the local TV channel, the Internet and other communication methods to transmit information to the citizenry.

2. **Public Information Office.** Activate the Public Information Office either in the emergency Operations Center or in City Hall as quickly as possible.

Policy 6-40: Community Preparedness

Support the CERT program to ensure the development of neighborhood based emergency preparedness throughout the City. Encourage cooperation with CERTs in other cities.

Accessibility to Medical Facilities

An earthquake of significant magnitude could temporarily isolate Cupertino from major full-service hospitals (Figure 6-F). City personnel, paramedics and local physicians will have to administer first aid until access to the major full-service hospitals is reestablished.

Policy 6-41: Disaster Medical Response

Coordinate with local emergency clinics to provide disaster medical response. Coordinate with the CERTs throughout the City to ensure that they are prepared to provide medical care at the neighborhood level.

Strategy:

Memorandum of Understanding. Develop a Memorandum of Understanding with local emergency clincs.

FLOOD HAZARDS

Floods are surface hydrological hazards that can have a significant, and sometimes, long lasting effect on a community. They can cause substantial property damage, and sometimes loss of life. Nationally, annual losses from floods generally exceed losses from other natural disasters.

Floods can originate from various sources: heavy rainstorms, landslides and/or dam failure. Regardless of their source, their impacts on a community can be devastating. Precautionary measures must be taken and preventive measures must be in place to prevent and/or minimize potential damages related to floods.

GOAL K

Protection from Risks Associated with Floods

Policy 6-42: Evacuation Map

Prepare and update periodically an evacuation map for the flood hazard areas and distribute it to the general public.

Policy 6-43. Flood Insurance Map Rates

Ensure that FEMA Flood Insurance Rate Maps are developed for the City of Cupertino.

Flood Hazards from Rainstorms

Rain related floods are seasonal. They are the most common type of floods, and usually occur during those periods of extended heavy rainfall. One of the contributory conditions to flooding in the urban environ-

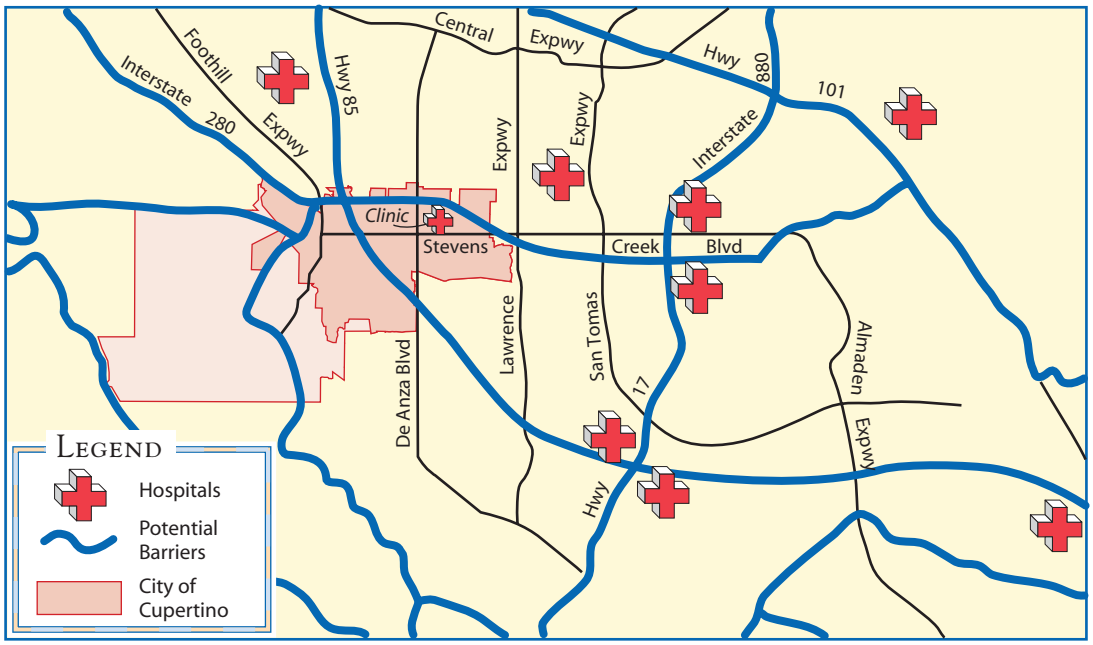


Figure 6-F. Areas Potentially Isolatable in a Seismic Emergency.

ment is the reduced percolation potential of the land, caused by increased development and/or paving. During extended periods of heavy rainfall the open/undeveloped lands are insufficient to absorb the rainfall and become saturated. Once the soils are saturated rainfall will sheet flow toward the lower elevations, seeking available outlets. If an adequate storm drainage system is not in place to dispose of the surface runoff, the end result of the excessive runoff will be floods.

Flood Hazards From Landslides

Landslides can generate floods by creating water basins. In Cupertino a landslide could occur within a steep ravine at the fringes of the foothills in the more mountainous terrain of the Urban Service Area boundary. In the event such a landslide were to occur in a ravine serving a relatively large watershed, the natural flow of water would be blocked off and water would collect behind the blockage created by the landslide. If appropriate spillways are not provided to relieve the pressure being exerted on the blockage, it could collapse, causing large volumes of water to precipitate down the ravine, causing injuries to people and/or damaging property. Landslides can also create floods by falling into a dam and/or reservoir displacing large volumes of water and spilling into the adjacent areas. Such landslides can also create seiches (the sloshing action within an enclosed or semi-enclosed body of water), which in turn can create large waves topping the dams and flooding downstream, causing property damage and injury to developments and residents downstream. Fortunately, the watersheds in this area are relatively small, so the risk of floods caused by landslides is minimal.

Flood Hazards From Dam Failure

Flooding resulting from dam failure is yet another hydrological hazard. The largest body of water within the area is the Stevens Creek Reservoir. Stevens Creek Dam meets current

dam safety standards and the probability of its failure is minimal. Causes for dam failure are numerous. They include inadequate design, construction deficiencies and sometimes poor underlying foundation conditions.

Policy 6-44: Emergency Response to Dam Failure

Ensure that Cupertino is prepared to respond to a potential dam failure.

Strategy:

1. **Emergency and Evacuation Plan.** Maintain a dam emergency and evacuation plan.

2. **Emergency Response to Dam Failure.** Coordinate dam-related evacuation plans with the City of Sunnyvale to ensure that traffic management between the two cities facilitates life safety.

Multiple Occurrences

Floods whether related to rainstorms, landslides or dam failure are independent events, but could also occur simultaneously. For example, a landslide could occur during a flood caused by a heavy rainstorm as a result of the land becoming saturated, possibly weakening the structural integrity of the hillsides or causing displacement of a large amount of stored water. And while the combination of rainstorm related flood and a landslide is not totally improbable, the likelihood of a seismic event that could rupture a dam also occurring at the same time is remote.

Infrastructure

With the exception of some the older areas of the planning area, such as Monta Vista, the City is served by a storm drainage system to accommodate a 10-year flood, and the City now requires that all new development adhere to this standard. In addition, the City proposes to upgrade the key parts of the older system through a long-term capital improvement program, including a project to specifically provide a storm drain system for the Monta Vista area.

The City has not studied in detail the carrying capacity of the existing system, but it is estimated that it could accommodate the runoff from a 10-year to a 40-year flood, although there would be some overflow that would run along the street gutters but ultimately dissipate into the major storm channels and creeks able to accommodate a 100-year storm. Heavier storms may cause some flooding of yards, but flooding of buildings would be extremely unlikely. As previously mentioned, there are a few areas of the City, such as Old Monta Vista and older areas next to the foothills, that are not protected by a storm drainage system. These areas would be subjected to flooding, but it is difficult, if not impossible, to predict the location and extent of the effect of the flooding in these smaller isolated areas. The extent of property damage caused by flooding in these areas would be commensurate to the intensity of the flooding, but the risk of loss of life is virtually non-existent.

Sediment deposits increase flood risks because they clog the drainage system as well as the natural percolation function of the streambeds, which replenish the underground water table. Sediment is caused by natural erosion as well as erosion induced by development, mostly in the hillsides. Removing sediment from the drain lines is a major expense to the City. Preventive measures, such as the City's Residential Hillside Ordinance require private hillside construction to install erosion control measures on all cut-and-fill slopes, including roadways, driveways, and house pads, help to minimize the problem.

Most water-storage facilities shown in Figure 6-G are designed to withstand ground shaking. If the magnitude of ground shaking was not previously assessed or if the water facilities were designed before new standards were developed, their structural integrity should be assessed. The City owns three tanks, but they are being leased to the San Jose Water Company. The San Jose Water Company is responsible for the maintenance and safety of the tanks. The City should work closely with the owners of other tanks and the San Jose Water Company to ensure that the structural integrity of all the tanks is maintained in accordance with the latest seismic engineering standards and that an evaluation of the possible areas of flooding be conducted.

Acceptable Level of Risk

An acceptable level of risk is the chance one is willing to accept weighed against the probability of the occurrence of an event that may cause property loss or injury. It is a conscious decision that takes into account the cost/benefit ratio of risk reduction. Risk reduction is proportionally related to cost, the lower the risk, the greater the cost.

Flood risks within Cupertino and its planning area are relatively low. There are a number of water storage tanks existing in the hillside areas (see Figure 6-G) that have the potential to inflict property losses and injuries to residents of homes existing in their proximity in the event of failure. However, the probability of their failure is considered to be very low; consequently, they are considered to be a minimal risk. The largest body of water within the area is the Stevens Creek Reservoir, and the probability of its failure is minimal. Figure 6-G depicts the extent of the inundation potential resulting from the failure of made-made water storage facilities.

Flood Plain

Stevens Creek and its streamside are among the natural elements that have the most influence on Cupertino's character. The creek strongly defines the boundary between the urban and rural parts of the City, extends a note of unspoiled beauty into the heart of the developed valley floor and gives many residents and visitors a space for play, relaxation or study of the creek's plant and animal life. Other creeks traversing the City are Permanente Creek, Regnart Creek and Calabazas Creek. These creeks collect surface runoff and channel it to the Bay. However, they also pose potential flooding risks should their levees be topped as a result of heavy runoff.

Land uses in the flood plain should allow the public access to the creek, but materials that would restrict the free flow of the creek waters or significantly disturb the riparian environment should be prohibited.

The Santa Clara Valley Water District and the City of Cupertino are actively involved in programs to minimize the risk of

flooding. The City developed a flood plain land use policy for the non-urbanized flood plain of Stevens Creek south of Stevens Creek Boulevard. This ensures the preservation of the 100-year flood plain and the protection of the riparian corridor along this portion of Stevens Creek.

The City and the Water District developed a flood management program for the flood plain of Stevens Creek between Interstate 280 and Stevens Creek Boulevard. The strategy is to keep the natural environment of Stevens Creek, although structural improvement may be necessary to protect properties from a 100-year flood. The majority of the people living in the Phar Lap Drive and Creston neighborhoods have a high flood risk, but they are partially covered by the Federal Flood Insurance Program.

The Santa Clara Water District has now completed the construction of the Calabazas Creek Project, which included the construction of a conduit across Interstate 280 to reduce the barrier effect created by the freeway itself that was built across the natural flood plain. The scope of the project also included improvements that should also minimize the flooding problems in the Miller Avenue area.

The watersheds in the Santa Cruz Mountain Range feed into four major streambeds that cross the City: Permanente Creek, Stevens Creek, Regnart Creek, Calabazas Creek. Figure 6-H shows the streambed locations and the extent of a 100-year flood, which has a one percent chance of occurring during any given year. The 100-year flood is the standard design flood accepted by the City, the Santa Clara Valley Water District and federal agencies.

Policy 6-45: Existing Uses in the Flood Plain

Allow commercial and recreational uses that are now exclusively within the flood plain to remain in their present use or to be used for agriculture.

Policy 6-46: New Construction in Flood Plains

Adopt stringent land use, zoning and building code regulations limiting new construction in the already urbanized flood hazard areas recognized by the Federal Flood Insurance Administrator.

Strategies:

1. **Finish Floor Level.** Install the first floor finish level of all habitable space of new construction above the inundation level of a projected 100-year flood.

2. **Description of Flood Zone Regulation.** Publish a description of flood zone regulations and a map of potential flood hazard areas in the Cupertino Scene.

Policy 6-47: Dwellings in Natural Flood Plain

Regulate closely all types of habitable development in natural flood plains. This includes prohibiting fill materials and obstructions that may increase flood potential downstream or modify the natural riparian corridors.

Policy 6-48: Hillside Grading

Restrict the extent and timing of hillside grading operation to April through October. Require performance bonds during the remaining time to guarantee the repair of any erosion damage. All graded slopes must be planted as soon as practical after grading is complete.

Facility Failures

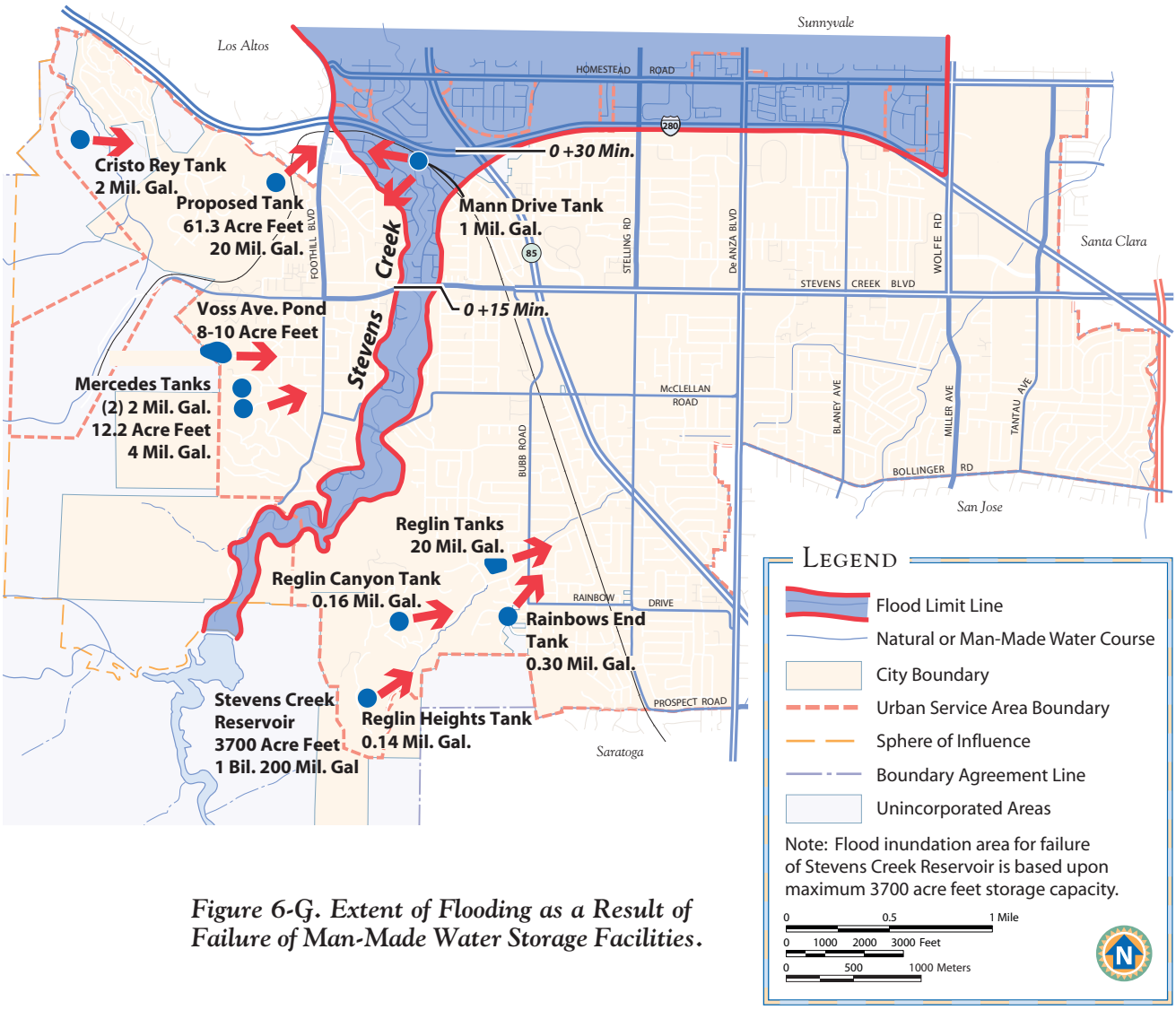


Figure 6-G. Extent of Flooding as a Result of Failure of Man-Made Water Storage Facilities.

Policy 6-49: Stability of Existing Water Storage Facilities

Assure the structural integrity of water storage facilities.

Strategy

Coordination with other Agencies. Work closely with the San Jose Water Company and owners of other water storage facilities to develop and implement a program to monitor the stability of all existing water storage facilities and related improvements, such as: distribution lines, connections and other system-components.

NOISE POLLUTION

Freedom from excessive noise is a major contributor to a high quality of life. This section gives a policy framework for guiding future land use and urban design decisions and

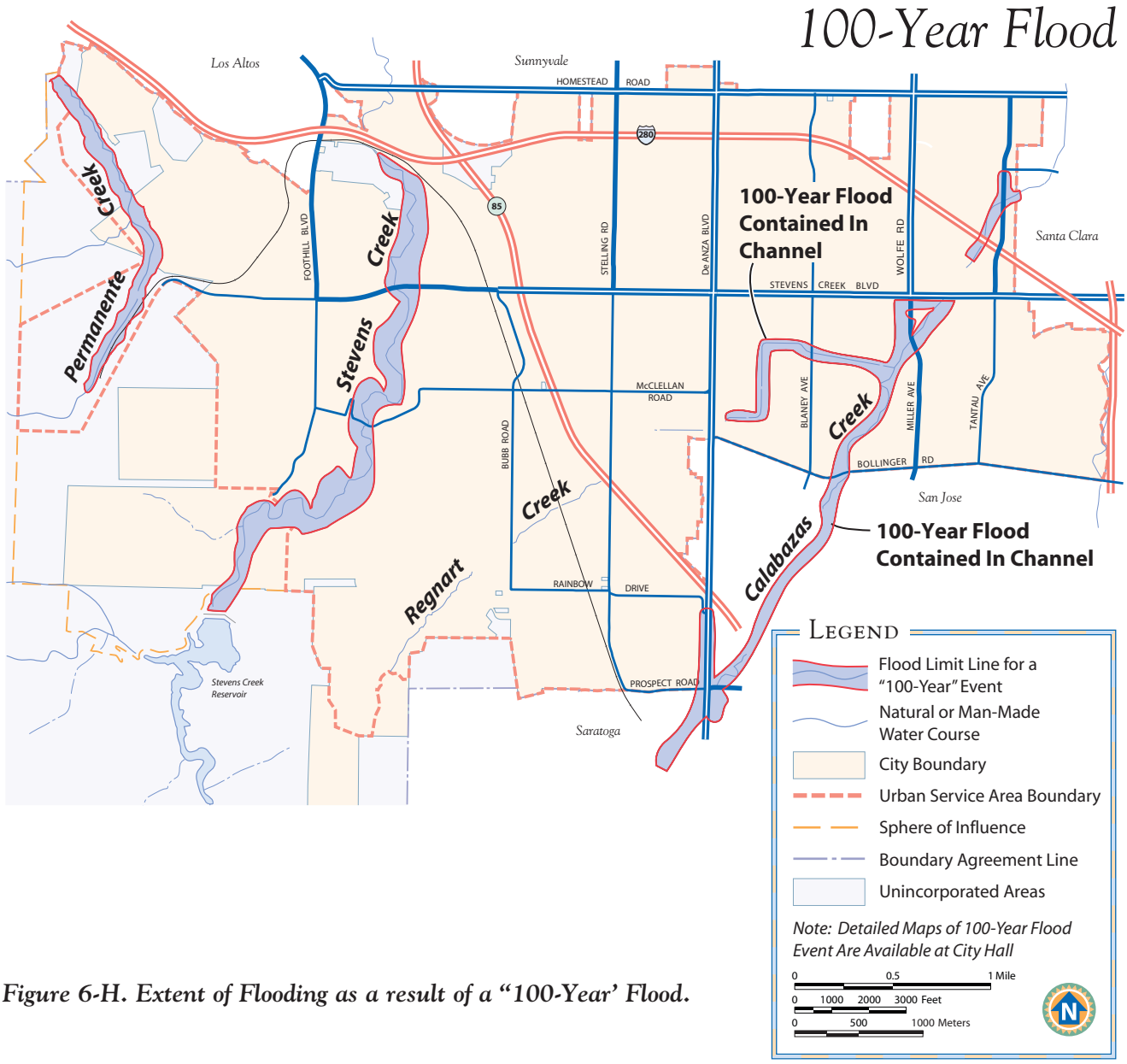


Figure 6-H. Extent of Flooding as a result of a "100-Year' Flood.

contains a system of control and abatement measures to protect residents from exposure to excessive or unacceptable noise levels.

The noise environment is an accumulation of many different sources, ranging from common machinery to the major source, street and freeway traffic. The degree to which noise is irritating depends on a variety of factors, some independent of the noise source itself. Time of day, background sound level, the listener's activity and surrounding land use can all influence the degree to which a particular sound is perceived as annoying. Value judgments also enter into tolerance for urban sound levels. Most people tolerate emergency sirens and loud lawnmowers because they represent neces-

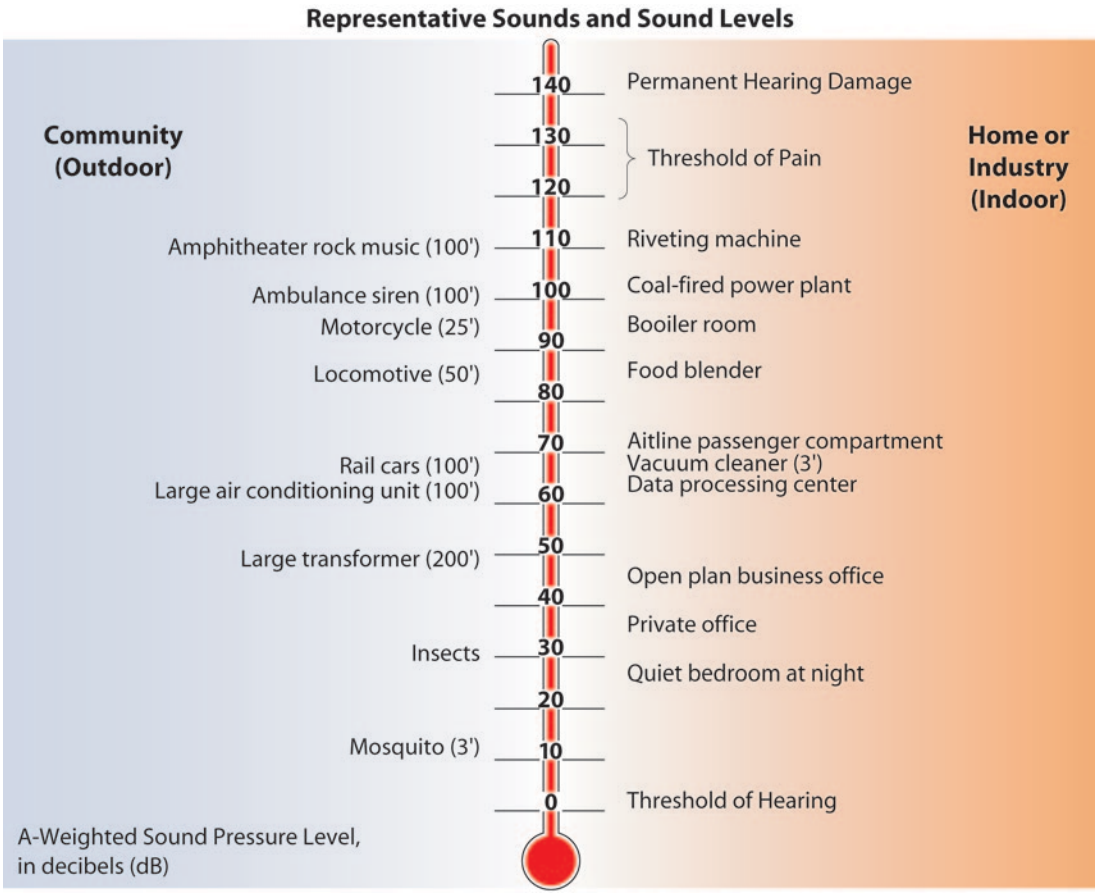


Figure 6-I. Typical Sound Levels Measured in the Community, Industry, and Home.

sary actions, public safety and neighborhood upkeep. However, loud noises from cars with defective or modified mufflers are usually perceived as annoyances.

Overall noise levels seem to be increasing despite efforts to identify and regulate noise sources. An increasing population density affects traffic on existing roads and construction of new roads, e.g., I-85, which opened since the past General Plan was prepared in 1993, raised overall noise levels. It is not possible to control all noise sources within Cupertino, but some regulation is needed to offset negative results of excessive noise.

Community Noise Fundamentals

A more comprehensive discussion of community noise is provided in the technical appendix. This discussion addresses only the basic nomenclature and concepts necessary to understand the technical portions of this noise element.

Noise is unwanted sound, and is therefore a subjective phenomenon that depends upon the listener's attitude toward the sound. The three elements of community noise are noise level, noise spectrum and variation in noise level with time. Noise level is measured in decibels (dB). Every noise is composed of various frequencies that define the character

of the noise. Since human hearing is more sensitive to the higher speech frequencies, the A-weighted frequency network is applied, according to national and international standards, to adjust the measured noise level to more closely relate to human perception of loudness.

Effective land use planning requires a means to assess various time-varying noise environments for their suitability for various land uses (e.g., housing, commercial, retail, industrial). Different noise environments have different time-varying characteristics; for instance a freeway may emit a fairly constant noise level for long periods while an airport may emit many short-term high level noise events punctuated by extended periods of quiet. To provide a standard measure for community noise exposure the State of California has adopted the Community Noise Equivalent Level (CNEL) as the standard metric (21CAC5000), and is used in this noise element. The CNEL metric is a 24-hour energy average measure that penalizes evening and nighttime noise, and provides a uniform measure for various time-varying noise environments in a way that generally relates to community annoyance over noise.

Noise Contours

Noise contour maps are created for land use planning purposes. The contour maps give a visual representation of the noise environment in Cupertino. The noise contours are conservative, meaning that the contours are modeled with minimal noise attenuation by natural barriers, buildings, etc. The noise level measured at a specific location may be lower than what is shown on the noise contour map. The purpose of noise element contours is to identify a need for additional acoustical investigations.

Two sets of CNEL noise contours were created: present day conditions (Year 2000) and future conditions (Year 2020). The following figures, 6-J and 6-K, represent Existing Year 2000 and Future Year 2020 noise contour maps, respectively. These contours indicate only a slight increase in noise levels.

Noise Monitoring

In order to characterize the noise environment in Cupertino, existing noise conditions in Cupertino were measured at six locations for a period of twenty-four hours. The following Table, 6-E, summarizes each measurement's location and corresponding CNEL value.

Table 6-E: Noise Monitoring Summary.

Location	CNEL Value
Stevens Creek Blvd at Vallco Financial Ctr.	69 dB
Stevens Creek Blvd. East of De Anza Blvd.	72 dB
South Stelling at Tomki Ct.	73 dB
Stelling North of I-280	72 dB
Foothill Blvd. at Silver Oak Wy.	76 dB
Bollinger Rd. West of Miller Ave.	73 dB

Land Use Compatibility

Noise Contours – 2000

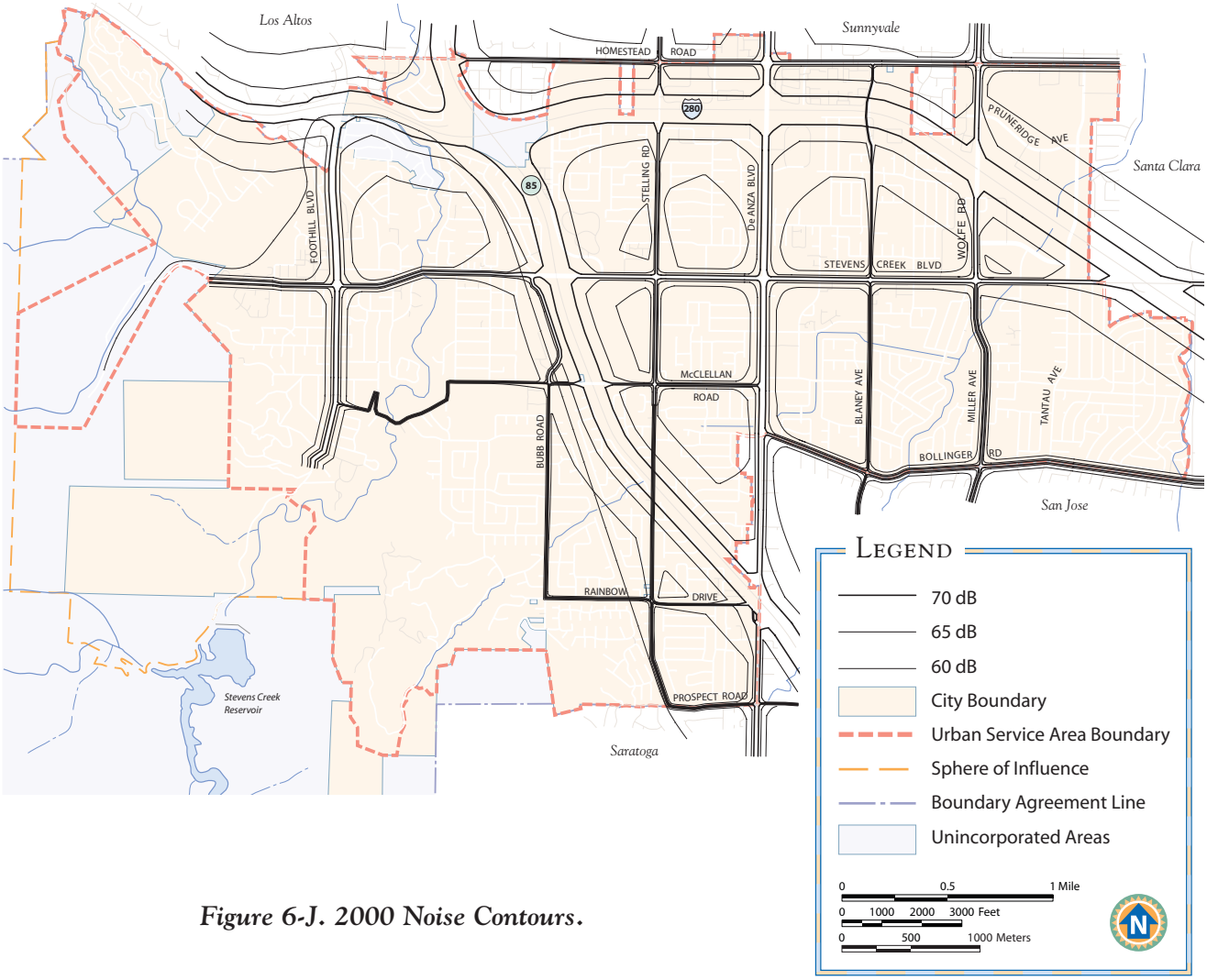


Figure 6-J. 2000 Noise Contours.

Many undesirable noise effects can be reduced or avoided if noise conditions are considered when assigning uses to specific land parcels. Noise cannot and should not be the primary factor considered in land use analysis, but the City should strive to match land uses to compatible noise levels.

Compatibility may be achieved by locating land use types outside of designated noise impact areas or by requiring modifications including setbacks, sound walls, building insulation or landscaping.

The Cupertino Municipal Code, Section 10, outlines the maximum noise levels on receiving properties based upon land use types.

Noise Contours – 2020

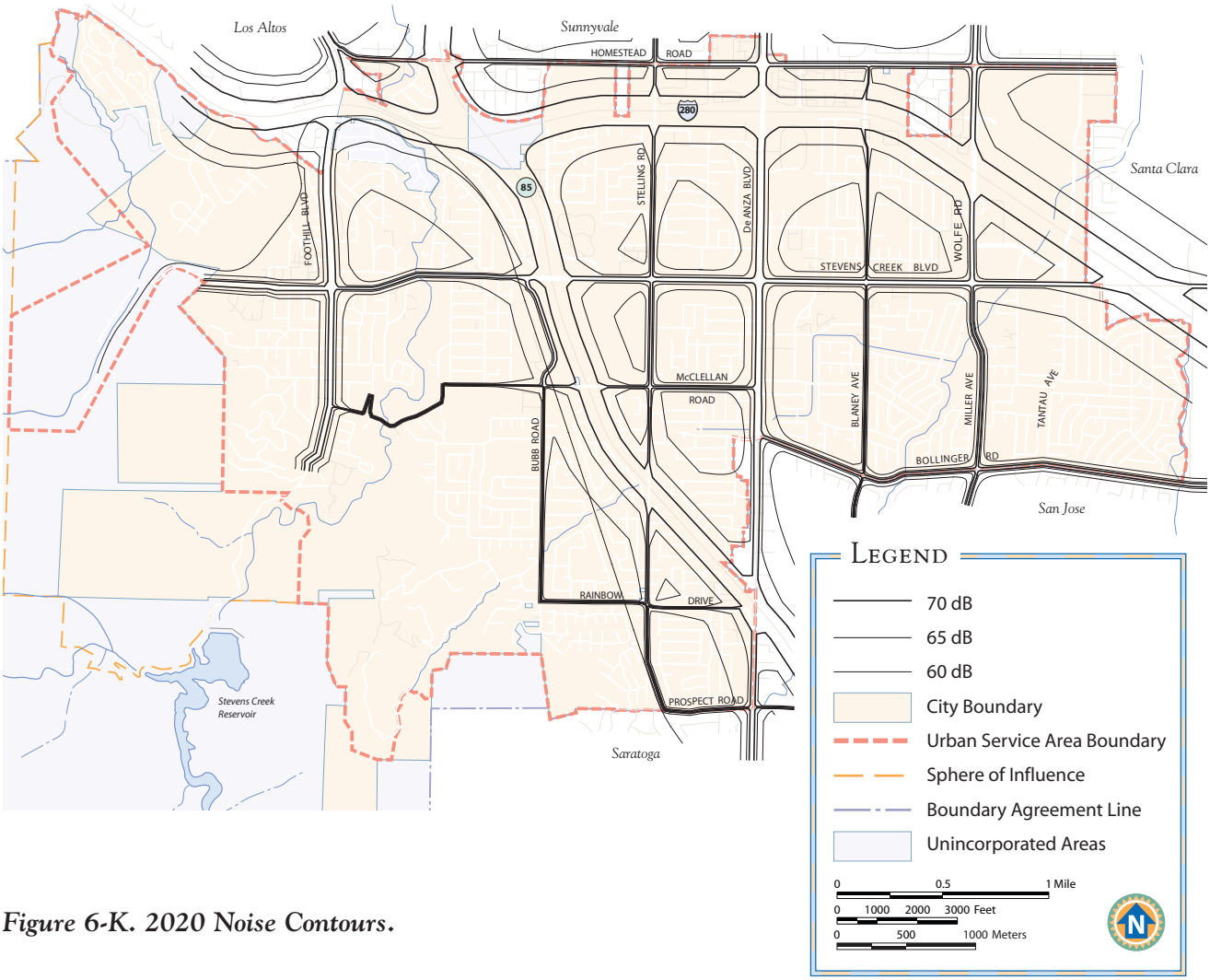


Figure 6-K. 2020 Noise Contours.

GOAL L

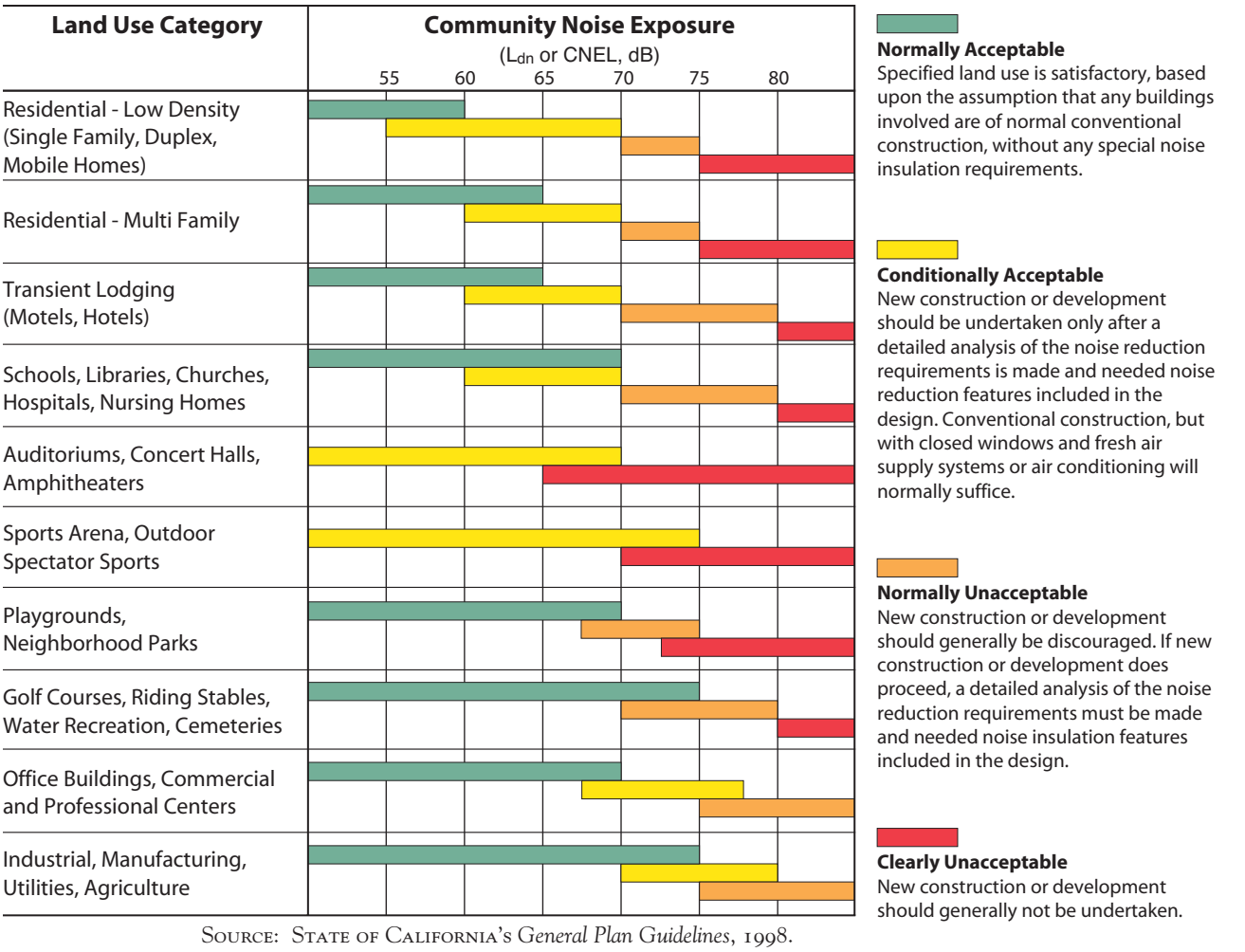
A COMPATIBLE NOISE ENVIRONMENT FOR EXISTING AND FUTURE LAND USES

Policy 6-50: Land Use Decision Evaluation

Use the Land Use Compatibility for Community Noise Environments chart and the City Municipal Code to evaluate land use decisions.

Strategy

Noise Review of New Development. Review the proximity of new or significantly remodeled housing to the traffic noise corridor by using the noise contour map and review the results of previous noise standards to see if the standards can be complied with through conventional construction practices. If there is not enough information, the staff may ask the developer to provide an acoustical analysis along with the application.



Source: State of California's *General Plan Guidelines*, 1998.

Figure 6-L: Land Use Compatibility for Community Noise Environments.6

Transportation Noise

Traffic noise is the greatest contributor to noise pollution in Cupertino and one of the most difficult to control through local effort. Two major freeways and three major arterial streets cross Cupertino.

Cupertino is fortunate that significant portions of Highways 85 and 280 are recessed, because this helps lessen noise in the surrounding neighborhoods. Freeway noise, at a constant but subdued level, is less of a direct threat to neighbors. Commuters use De Anza Boulevard and Stevens Creek Boulevard heavily and greatly increase local traffic congestion, air pollution and noise.

When the Municipal Code allowing maximum noise levels are compared to the existing noise levels (Figure 6-J—Existing (Year 2000) Noise Contours), the majority of locations are currently experiencing noise levels above the maximum allowable.

New development in these areas will be required to build and incorporate design strategies outlined in the policies of this document to meet the maximum allowed internal and external noise levels.

Reduced noise impact of major streets and freeways on Cupertino residents

Policy 6-51: Freeway Design and Neighborhood Noise

Ensure that roads and development along I-85 and I-280 are designed and improved in a way that minimizes neighborhood noise.

Policy 6-52: Stricter State Noise Laws

Support enactment of stricter state laws on noise emissions from new motor vehicles and enforce existing street laws on noise emissions.

Policy 6-53: Neighborhood Need Priority

Review the needs of residents for convenience and safety and make them a priority over the convenient movement of commute or through traffic where practical.

Policy 6-54: Traffic Calming Solutions to Street Noise

Evaluate solutions to discourage through traffic in neighborhoods through modified street design. Examples include meandering streets, diverters, landscape islands and wide parking strips.

Strategy

Local Improvement. Modify street design to minimize noise impact to neighbors.

Train and Aircraft Noise

Trains and aircraft do not contribute much to noise in Cupertino. Aircraft flying into Moffett Field Naval Air Station are restricted to the northeastern corner of Cupertino, affecting some residents of the Rancho Rinconada neighborhood. Cupertino's one railroad line passes through the Monta Vista neighborhood and connects with the Hanson Permanente Plant in the Western foothills. There is one train three times a week (2 trips - one in, one out), which occurs usually in the afternoon or early evening hours. Noise levels associated with the trains are approximately 85-90 decibels at a distance of 50 ft. from the track for a period of two minutes. There are no noise protection devices along the rail corridor, and if increases in rail activity occur, other mitigation may be required.

Truck Traffic

The most crucial example of traffic noise intrusion on the quality of neighborhood life is the effect of heavy-duty truck trips to and from the Hanson Permanente Cement Plant and Stevens Creek Quarry located in the western foothills near Stevens Creek Boulevard and Foothill Boulevard. There are about 1,400 trips each working day, which generate noise levels up to 90 dB next to the road. When trucks speed up, slow down or use their high-powered brakes on the unusually steep road, the truck noise problem is worsened.

Quarry trucks on Foothill Boulevard

Policy 6-55: Noise Improvement by Restricting Trucks

Work toward improving the noise environment along Foothill Boulevard and Stevens Creek Boulevard by restricting quarry truck traffic especially during late evening and early morning hours. It is preferable that the restrictions be voluntary. Encourage alternative to truck transport, specifically rail, when feasible.

A study prepared by professional acoustical engineering consultants suggested a series of measures to diminish noise for homes along the truck traffic corridor. Reducing truck travel and carrying out these measures could give some relief to the residents most severely affected.

Policy 6-56: Reduction of Noise from the Hanson Permanente Trucks

Work to carry out noise mitigation measures to diminish noise from the Hanson Permanente truck traffic for homes near Foothill and Stevens Creek Boulevards. These measures include regulation of truck speed and the volume of truck activity.

Strategy

Restrictions in the County's Use Permit. Coordinate with the County to restrict the number of trucks, their speed and noise levels along Stevens Creek Boulevard, to the allowed in the Use Permit. Ensure that restrictions are monitored and enforced by the County.

Policy 6-57: Road Improvements to Reduce Truck Impacts

Consider road improvements, such as medians, landscaping and the addition of bicycle lanes to reduce quarry truck impacts.

Non-Transportation Noise Sources

Noises not generated by traffic are typically stationary and/or sporadic. They have a relatively minor effect compared to traffic noise, but noises such as permanent equipment (refrigeration or air conditioning units or other related pumps), barking dogs and rattling of garbage cans when people are trying to sleep can be annoying and disruptive. Complete regulation of these noises is unlikely, but the City can work to protect neighborhoods from excessive noise and require compliance with the noise standard during the evening and early morning, when ambient noise levels tend to be lower.

Short-term noise sources are also disruptive. Temporary activities such as construction can often last for several months and generate a substantial number of complaints. Some are unavoidable, but superior muffling devices for construction equipment can reduce noise from jackhammers, portable compressors and generators. City ordinances control the days and hours of construction operations. Policies are provided to limit noise levels. In several

cases building construction is stopped during evenings and weekends.

Adjoining Dissimilar Land Uses

People who live near commercial loading docks often complain of late night and early morning disturbances. Similarly, sounds from automobile repair shops and general manufacturing processes often annoy those who live near industrial areas. Economic and property rights interests of these businesses must be balanced with the community's need for a quiet environment, and should be studied carefully at the beginning of a commercial or industrial project that will adjoin homes.

GOAL N

RESIDENTIAL AREAS PROTECTED AS MUCH AS POSSIBLE FROM INTRUSIVE NON-TRAFFIC NOISE

Policy 6-58: Commercial Delivery Areas

Be sure new commercial or industrial developments plan their delivery areas so they are away from existing or planned homes.

Policy 6-59: Delivery Hours

Actively enforce Section 10.48 of the Municipal Code limiting commercial and industrial delivery hours adjoining residential uses.

Policy 6-60: Noise Control Techniques

Require analysis and implementation of techniques to control the effects of noise from industrial equipment and processes for projects near homes.

Policy 6-61: Hours of Construction Work

Restrict non-emergency building construction work near homes during evening, early morning, and weekends by enforcing the noise regulations in the Municipal Code.

Policy 6-62: Construction and Maintenance Activities

Regulate construction and maintenance activities. Establish and enforce reasonable allowable periods of the day, for weekdays, weekends and holidays for construction activities. Require construction contractors to use only construction equipment incorporating the best available noise control technology.

Noise Attenuation

Reducing noise intrusion into residences can be accomplished in the same way homes are insulated against cold. Leaks around doors, windows, vents or through open fireplace dampers, as well as single-glazed windows and lack of seals or weather-stripping, increase noise intrusion and can be remedied. Sound is pervasive in cities and it's difficult to control exterior noises.

Different noise control techniques can be used with varying degrees of success. Each site should be evaluated to find the best combination of noise control devices. Here is a summary of common techniques and their uses.

Barriers

Sound walls can reduce noise from 5 to 15 dB. Their effectiveness depends on the relative grade of the roadway, the distance of the listener from the centerline of the nearest road, placement and height of the sound wall in relation to the receptor line, the size and location of the area to be protected and the frequency of the noise source. The barrier is more successful with higher-pitched noise and is usually more effective when located close to the source or to the listener, assuming that both are below the top of the barrier.

Sound walls can be unattractive and can enclose or separate neighborhoods. Landscaping is a less expensive and effective way to make the walls more attractive and will also reduce sound reflection from the walls. Evergreen and vines should be planted along the roadway side. Reflection can increase noise levels on the opposite side by as much as 5 dB.

Policy 6-63: Sound Wall Requirements

Exercise discretion in requiring sound walls to be sure that all other measures of noise control have been explored and that the sound wall blends with the neighborhood. Sound walls should be landscaped.

Landscaping and Setbacks

Landscaping and setbacks for small properties do not work well in reducing noise. Plants and trees are not dense enough to prevent airflow. Setbacks must be substantial to make a difference in noise. Noise attenuates about 3 dB for heavy traffic and about 6 dB for light traffic every time the setback from the centerline of the roadway is doubled.

Building and Site Design

Building and site design techniques can control noise effectively in new developments or when existing buildings are modified. Sensitive areas can be set back or buffered by buildings, parking or recreation areas. Homes can use rooms such as kitchens, bathrooms and garages to buffer the more sensitive bedrooms and living rooms. Buildings should face solid walls onto the noise source and be sure that no vents or other air leaks face the noise source.

Insulating Buildings From Noise

Conventional building practices typically achieve exterior-to-interior noise reductions from adjoining roadways of about 10 dB with open windows and 20 dB with closed windows. Considerably higher noise reduction is possible with specialized acoustical design and construction.

Table 6-F shows noise reduction from typical building types

Buildings Designed to Diminish Noise

Policy 6-64: Building Code Sections on Exterior Noise Intrusion

Require the City Building Department to enforce all sections of the California Building Code for exterior sound transmission control (Sec. 1208A.8.1).

Policy 6-65: Building Code Sections on Interior Noise

Encourage the City Building Department to enforce all sections of the California Building Code relating to interdwelling sound transmission control (Sec. 1208A.1.6).

Policy 6-66: Application of Policy 6-63 to New Single-family Homes

Consider applying the California Building Code requirements for exterior sound transmission control (Sec. 1208A.8.1) to construction of new single-family housing.

Table 6-F. Approximate Exterior-to-Interior Noise Reduction Achieved by Structures.

Bldg. Type	Window Condition	Exterior-to-Interior Noise Reduction	Maximum Exterior CNEL Value for 45 dB Interior CNEL Value
All	Open	10 dB	55 dB
Light Frame	Ordinary sash, closed	20 dB	65 dB
Masonry	Single pane, closed	25 dB	70 dB
Masonry	Sound-rated windows, closed	35 dB	80 dB