Chapter 10
Health and Safety

INTRODUCTION

The purpose of the Health and Safety chapter of the General Plan is to reduce the risks associated with environmental hazards and protect the community's health from the affects of noise and other environmental hazards. The Chapter also assesses the City's current preparedness in regard to emergencies, and the need for providing additional protective measures.

The chapter is divided into sections related to each of the following issues:

Geologic Hazards
Seismic Hazards
Flood Hazards
Fire Hazards
Hazardous Material and Waste and Other Safety Issues
Emergency Preparedness
Noise

Each section is divided into two parts:

- Setting: identification of existing conditions for each issue.
- Projection: expected conditions in regard to the hazard or condition. Projections in regard to hazards are, at best, a guess about when a potential hazard will become a problem based on the relative frequency of past events.

The final section of this chapter, presents the City's goals, objectives, policies and implementation measures for addressing the hazards and conditions that potentially threaten the community's health and safety.

GEOLOGIC HAZARDS

Setting

Geologic conditions must be taken into account in the planning and development of any parcel of land. The danger to property and health increases when property is developed in ways which are unsuitable to geologic conditions. When structures or roads are built on geologically unstable land such as landslide areas, unstable slopes or areas subject to subsidence, there is an increased risk to the community.

Generalized Geology and Physical Characteristics

Much of Fremont is flat, unsloped land underlain by a relatively stable geologic formation. Underlying Fremont is a deep bedrock trough which rises to form the steep hills in the eastern part of the City and the Coyote Hills at the Bay margin. This trough has been filled with alluvium deposited by streams flowing from the hills, and with Bay mud sediments.

Moving from east to west, subsurface materials include progressively more clay and silt and less sand and gravel. In most areas these materials are mixed, due to the wandering pattern of stream beds. Ground water, another important geologic consideration, is relatively high east of the Hayward Fault (see Figure 10-5 for location) due to the impervious barrier formed by the pulverized materials of the fault zone. West of the fault the water table level is substantially lower, rising again near the Bay.

Slope Instability

Most sloping land has some potential for slope instabilities leading to landslides or mudslides. Slope stability is affected by several factors including steepness of slope, weak or unconsolidated soil units, formations with a high clay content, water saturation, vegetation removal, and seismic activity. Usually a combination of several factors will cause a sloped hillside to fail, with a single factor such as heavy rainfall or an earthquake being the catalyst responsible for initiating slope failure.

Landslides

An extensive area of historic landslides lies along I-680 south of Curtner Road, in Niles Canyon and on the westerly slopes of Mission Peak, Mt. Allison and Monument Peak. Although most landslides are natural occurrences, some damaging landslides result from human carelessness or improper construction. Development activity on sites susceptible to landslides can trigger landslide activity, particularly when the natural slope has been steepened or the toe of the slope has been cut away for road or building construction. Buildings and roads located on sites where landslides have previously occurred or where landslide susceptibility is high have an increased potential for property loss and human endangerment.

When slopes fail and landslides occur in developed areas, creeks and streams below the slide area may become dammed with slide debris and result in flooding. Additionally, landslides often block major access roads in the hill area due to slope failure. This has occurred in the past on major single access roads in the City such as Morrison Canyon Road, Mill Creek Road, Interstate 680, Niles Canyon Road and Sabercat Road which lie downhill from areas subject to landslide and slope instability.

In the past, development in Fremont's sensitive hill areas consisted of scattered rural residences, ranch and farm buildings; few dwellings or related structures were in areas of high landslide potential. In the past few years, more residential development has occurred on hillside ranch land in the eastern portion of the City increasing the number of dwelling units exposed to the hazards of potential landslides.

The City's policy is to require site specific geologic investigations and soils reports be prepared and submitted during the development review process for sites prone to geologic hazards. These studies must recommend measures to mitigate any potential hazards related to building construction or grading. The City's consulting geologist reviews the submitted reports for acceptability, and projects must be built according to the recommendations of the City geologist. Grading plans are reviewed for conformance with the City's grading ordinance. In unstable areas the City seeks to minimize grading of slopes and limit it to where it is essential for development. The grading plan also includes procedures to improve slope stability and must follow accepted engineering design standards.

Mudslides

Mudslides are shallow landslides saturated by water that travel rapidly downslope as muddy slurries. Mudslides commonly travel at speeds greater than 20 mph, although in some areas speeds in excess of 100 mph have occurred. They flow like water and typically follow water courses. Most mudslides are localized in small gullies threatening only few buildings in their direct path. They are often overlooked hazards because they can travel thousands of feet or even miles from the source and may occur in areas with no known previous mudslides.

Mudslides are most likely to occur on steep loose soils that are saturated with water. Most rainstorms are of such low intensity that mudslides do not occur although in January of 1982 thousands of mudslides were triggered in the Bay Area by intense rainfall. Mudslides can also be triggered by broken water pipes or misdirected runoff. Most mudslides originate in areas where vegetation has been removed. Hilly areas denuded by wildfire are especially susceptible.

Subsidence

Prolonged pumping of groundwater can lower the water table over a large area and contribute to subsidence, or extreme ground failure, unrelated to earthquake activity. Even though the groundwater level has been lowered within Fremont due to pumping, no subsidence or other effects have been noted at the ground surface related to water withdrawal. A program

of groundwater recharge has been underway for several years under the direction of the Alameda County Water District, and groundwater levels are now stable.

Subsidence is most likely to occur in Fremont in areas of moderate to high liquefaction potential related to earthquake activity. Liquefaction and this form of subsidence are discussed in the next section on Seismic Hazards.

Projections

Areas of Potential Landslides and Slope Instability

Landslides may occur at any time but are more likely during the rainy season. Earthquake shaking increases the likelihood of landslides and the potential for increased damage, injury, disruption of utilities and blockage of access. An earthquake occurring in late winter when soils are highly saturated with water would be the most hazardous in terms of landslide danger.

The eastern Hill Area of the City has the most potential for landslides or other slope instabilities. The Slope Instability Map, Figure 10-1, indicates the potential for landsliding or other slope instabilities. It is based on the steepness of slopes and underlying geology (see the Health and Safety background report for more details). The map is general in nature; the potential for landsliding on individual parcels must be determined by site specific geotechnical analysis. The map shows the following general categories of slope instability:

- I_3 Areas classified as I_3 have potential for localized landsliding or slope instabilities over a widespread area. In these areas, more than half of the land is estimated to have some slope stability problems. However, landslides will tend to be relatively small: usually less than 50 feet long affecting one or two parcels.
- I_2 Areas classified as I_2 have potential for major landslides in localized areas. The size of potential landslides in these areas can be several hundred feet long and can involve areas of several acres. Within this category it is expected that slope stability problems will affect roughly 25 to 50% of the land.
- I_1 Areas classified as I_1 have the potential for localized landslides.

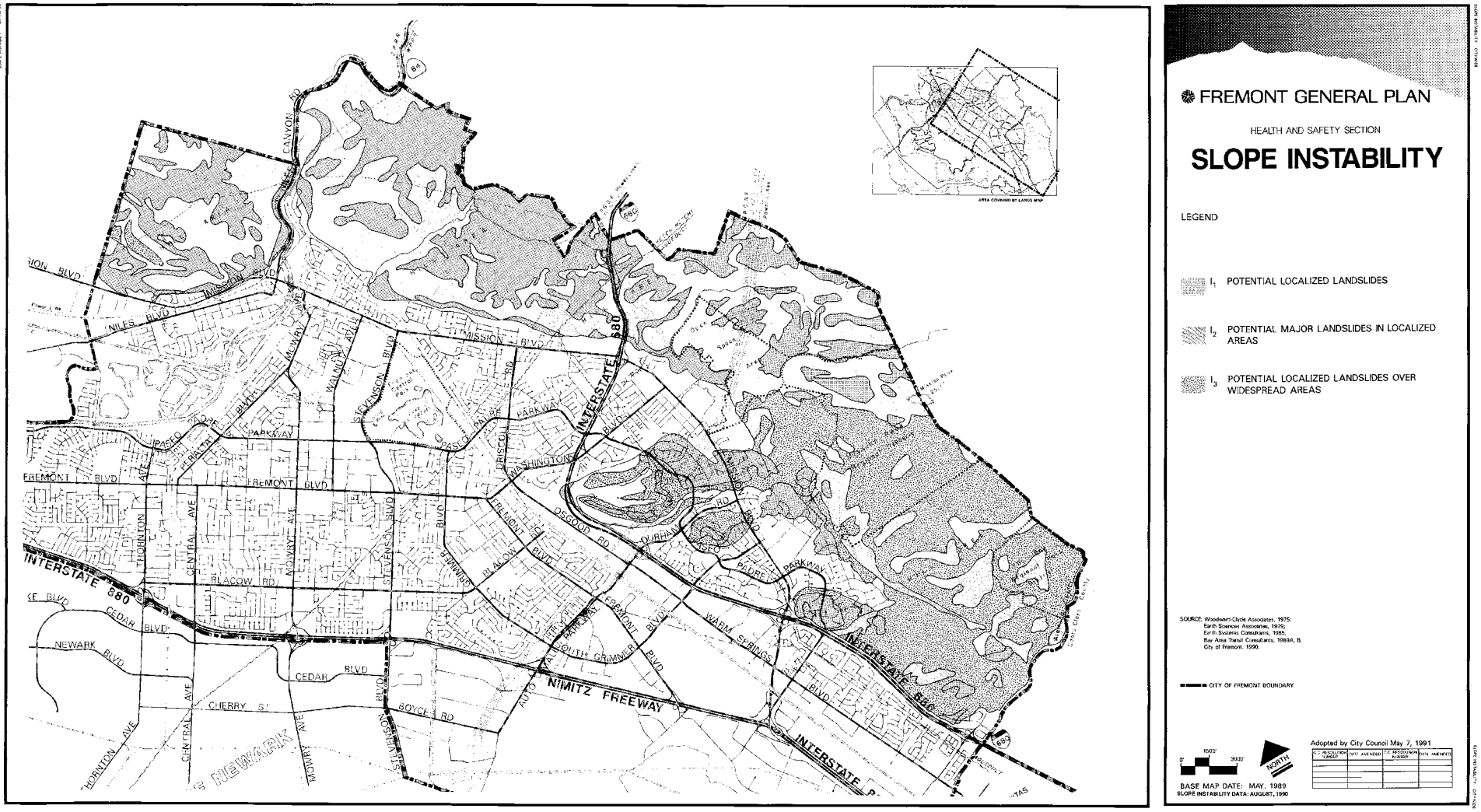

Figure 10-1 Slope Instability Map

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Geologically Constrained Land

There is relatively little unconstrained vacant residential land remaining in Fremont for new development. In the future, a larger proportion of all development will be in areas with geologic constraints. Careful investigation of geologic conditions will be an increasingly important prerequisite to development. Supervision of the development process is also necessary to ensure that required mitigations for geologic conditions are implemented and proper engineering practices are followed in grading.

SEISMIC HAZARDS

Earthquakes are a recurrent phenomenon in the western mountain and coastal areas of California. The western edge of California is at the boundary between two of the "plates" that constitute the earth's crust. The occasional release of accumulated strain between these plates is expected to generate earthquakes in California indefinitely. Severe earthquakes can cause widespread direct damage due to shaking and ground failure. They can also cause severe secondary damage, including fires and flooding (due to dam failure).

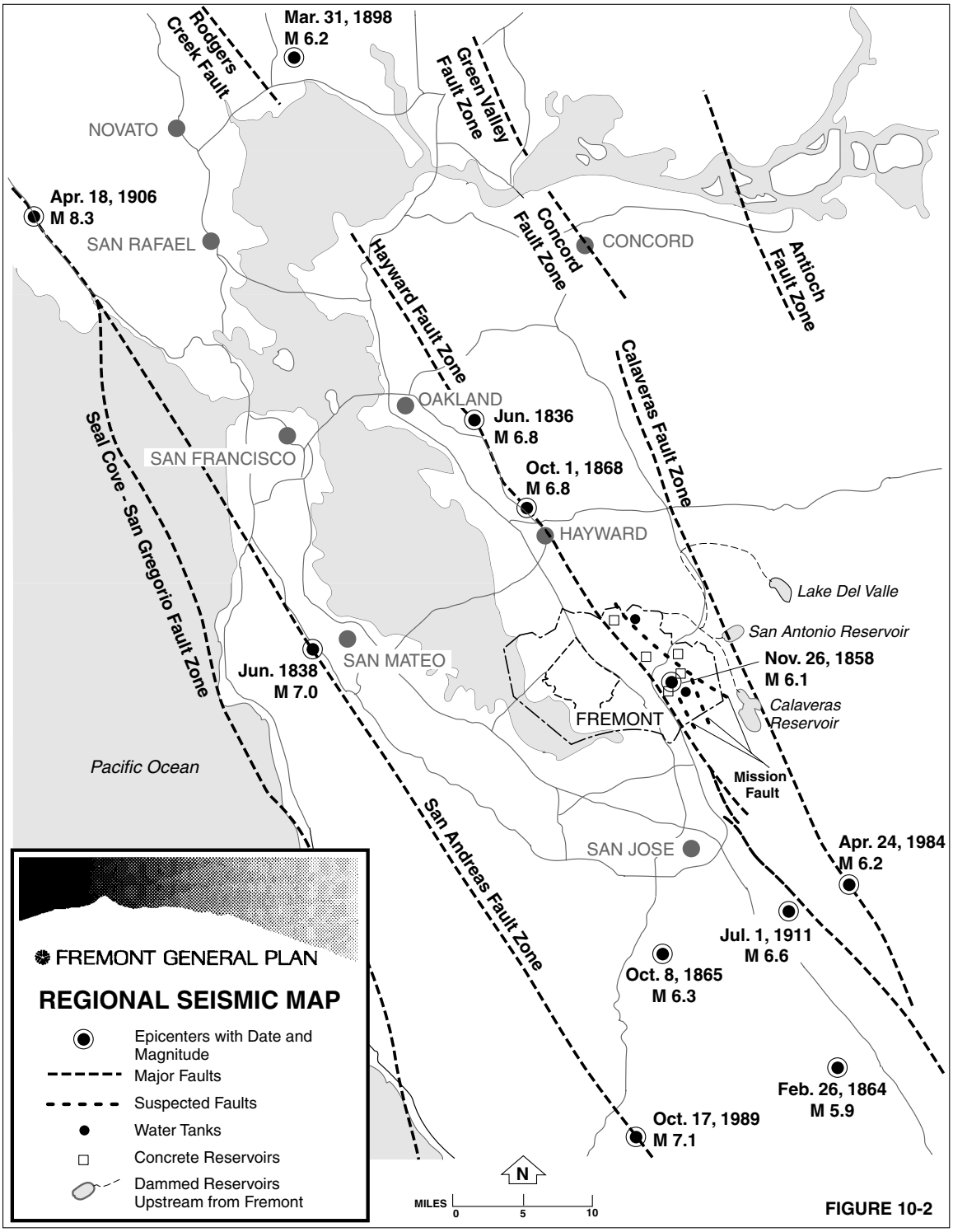
While cities in coastal California can reduce earthquake damage with proper design and engineering of structures, it is not possible to eliminate the danger, as recent experience during the October, 1989 earthquake has amply demonstrated. This section discusses the risks the City of Fremont faces in regard to earthquakes, and its actions to address that risk.

Setting

The Bay Area is crossed by several faults which are part of the San Andreas Fault system. The San Andreas fault travels through much of the coastal areas of California, traversing San Mateo County, east of Fremont (see Figure 10-2). The San Andreas fault is the largest fault in California with the potential for the most severe earthquakes. Fremont is traversed by the Hayward fault, a "branch fault" of the San Andreas system. Another branch fault of the San Andreas fault in the vicinity of Fremont is the Calaveras fault on the eastern edge of the Diablo Range.

A seismic event (an earthquake) on any of these major faults could cause damage in Fremont. The amount of resulting damage would be dependent on the magnitude of the earthquake, localized soil conditions and the proximity of development to the focus or epicenter of the earthquake.

Figure 10-2
Regional Seismic Map



Source: California Division of Mines and Geology; National Earthquake Information Center

Earthquake Measurement

The strength and severity of earthquakes are measured by two seismic scales, the Richter Scale and the Modified Mercali (MM) Scale. Earthquake magnitude at the epicenter (the point on the ground surface above the point of initial energy release) generally is recorded on the Richter scale, a logarithmic scale related to seismograph readings. A quake of magnitude 7.0 on the Richter Scale at the epicenter may be felt as different intensities depending on distance from the epicenter, soil and rock conditions, and other geographic or geologic factors.

The Modified Mercali (MM) Scale is a partly subjective measurement based on the effects of an earthquake on man-made structures, people and topography. This scale can provide a useful measurement of earthquake intensity throughout the area where the quake is felt.

Earthquake Fault Activity and Identification

The identification of earthquake hazards in Fremont requires a description of the secondary effects of earthquake activity caused by the sudden movement along a fault line. These secondary effects consist of: 1) groundshaking; 2) surface rupture or ground displacement along fault traces; 3) ground failure; and, 4) seismically induced water inundation.

Groundshaking is the surface wave motion caused by the passage of seismic waves through the earth's outer crust during an earthquake. Surface rupture or ground displacement is the fracture of soil or rock on the earth's surface. Earthquake induced ground failure occurs when the ground looses its cohesive nature and bearing strength due to the instability of the soil or rock. Ground failure may take the form of landslides, mudslides, liquefaction, rock falls or subsidence.

Subsidence or differential settlement is the downward movement of soil caused by a shift of the underlying sediments which results in a depression in the soil surface. Subsidence often occurs in areas affected by liquefaction during strong seismic shaking. **Liquefaction** is the process of saturated loose soils becoming liquid or "quick" under earthquake shaking. Under such conditions, the soil loses its bearing strength and may settle or flow much like quicksand.

The potential for groundshaking and liquefaction depends largely on the underlying geology. Groundshaking potential is closely related to depth to bedrock formations, cohesion, and density of sediments down to the bedrock.

The potential for seismically generated ground failures is greatly increased if an earthquake occurs during a period of heavy rainfall, when hillside slopes are saturated and the ground water table is closer to the surface. The potential for liquefaction is affected by the severity of groundshaking, topography, and geologic conditions near the surface. Liquefaction commonly occurs in soils composed of layers of silt or sand sediments or where poorly compacted fill has been used. In Fremont, water-saturated soils or bay mud in the Baylands and wetland areas of the western portion of the City are particularly susceptible to liquefaction.

Groundshaking and liquefaction potential are shown on Figure 10-3. The areas mapped relate to generalized underlying geologic conditions described in Table 10-1. The groundshaking and liquefaction potential categories are arranged in order of probability of occurrence. These maps are generalized; more specific assessment of groundshaking and liquefaction potential is necessary to determine the magnitude of risk for any particular parcel of land. No liquefaction potential has been assigned in the Hill Area and Coyote hills which are underlain by bedrock and not subject to liquefaction.

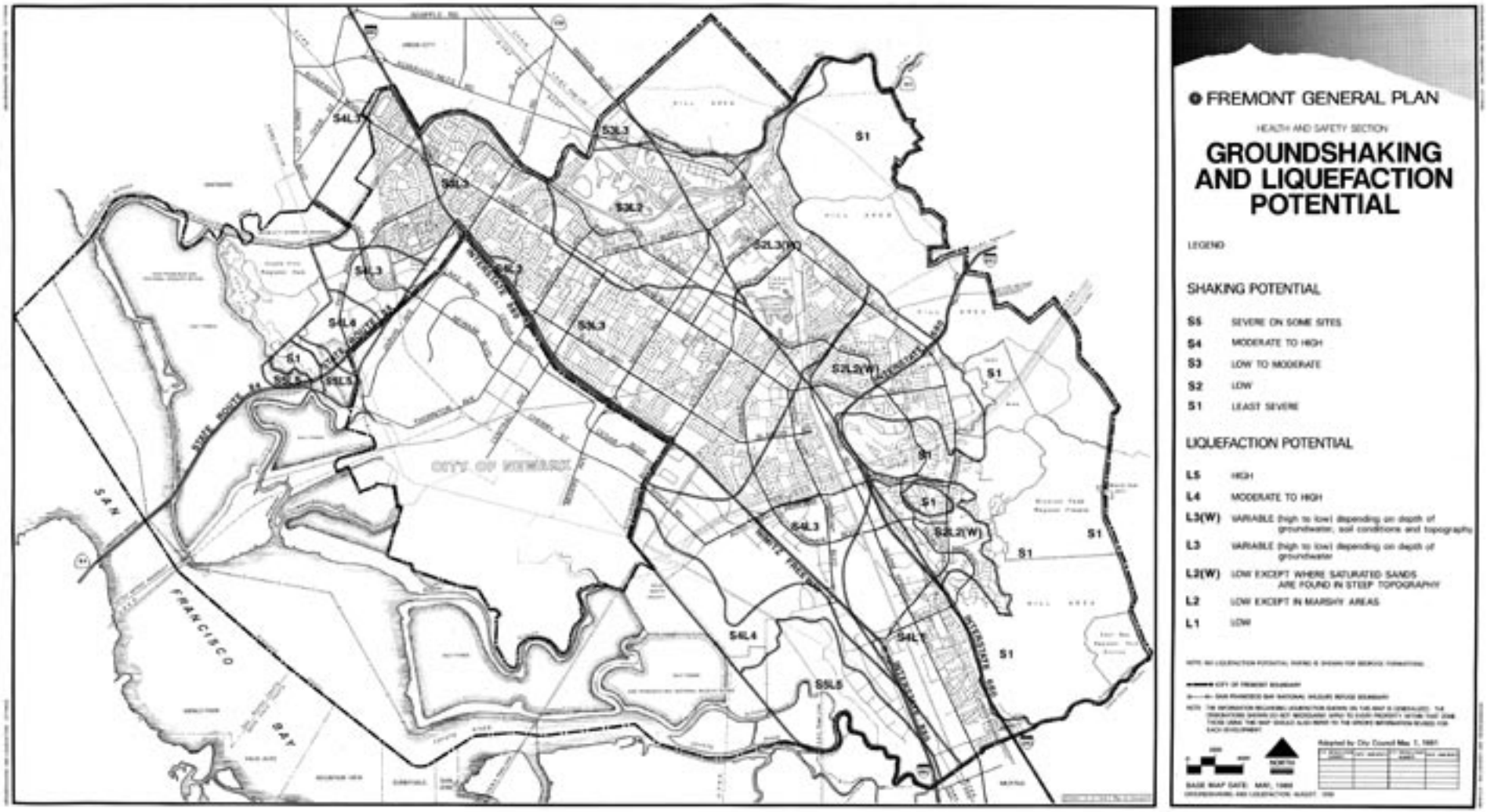


Figure 10-3 Groundshaking and Liquefaction potential map

Table 10-1 Underlying Geologic Conditions		
Geology and Site Conditions		**Impact**
S1	Bedrock formation	Least severe shaking potential
S2	Dense cohesion less soils. Depth to bedrock varies from less than 10 feet to 200-300 feet.	Low shaking potential, but somewhat more severe than in Area S1.
S3	Dense cohesionless soils. Depth to bedrock 400-600 feet.	Moderate shaking potential, somewhat severe than in Area S2.
S4	Medium to stiff cohesionless soils. Depth to bedrock 400 feet; shallower near Coyote Hills.	Moderate shaking potential; but more severe than in Area S2, possibly somewhat more severe than in Area S3.
S5	Underlain by soft to medium cohesionless soils in upper 50 feet. Depth to bedrock 400 feet or greater.	Severe shaking on some sites.
Liquefaction		
L1	Stiff clays. Shallow groundwater (5-20 feet): considerable perched water.	Low liquefaction potential.
L2	Clay, silts sand in upper 15-20 feet, gravel and sand below. Marshy areas near Hayward Fault. Groundwater to 30-60 feet below surface.	Liquefaction potential low except in marshy areas along Hayward Fault.
L2(w)	Stiff clays and dense sands (alluvial or residuum above rock). Groundwater at 20 feet or deeper. Some perched water.	Low liquefaction potential except where saturated sands are found in steep topography.
L3	Clay, silt, sands in upper 50 feet, sand and gravel below. Groundwater 30-60 feet below surface; perched water at 5 feet below surface.	Low to high liquefaction potential depending on depth to groundwater. Minor to moderate differential settlements could occur.
L3(w)	Variable mixture of clays and loose to medium silts and sands in the upper 20 feet. Deeper soils on sand-gravel mix. Groundwater varies from 5 to 40 feet below surface.	High to low liquefaction potential depending on depth to groundwater, soil conditions and topography.
L4	Stiff clays with silt and sand lenses. Shallow groundwater (5-20 feet).	Moderate to high liquefaction potential.
L5	Recent Bay Mud, overlying older alluvium and older mud. Groundwater at 3-10 feet below surface.	High liquefaction potential.
Source: U.S. Geological Survey, Probabilities of Large Earthquakes Occurring in California on the San Andreas Fault, Open File Report 88-398, Menlo Park, California, July 1988.		

Seismically induced water inundation results when severe groundshaking causes waves or seiches in a confined body of water to overflow the banks and flood the surrounding area. Typically, the waves created by groundshaking are less than one foot high and may affect only the immediate shoreline of a creek, stream or lake. In the unlikely event that an earthquake caused seiche occurred in the Bay west of Fremont, waves would run up on the undeveloped shoreline area.

Special Studies Zones

The Alquist-Priolo Hazard Zones Act passed by the State legislature in 1972 established Special Studies Zones along faults considered by the State Division of Mines and Geology to be active or potentially active. An active fault is defined as an area which has experienced surface displacement during recent geologic time (within the past 10,000 years), indicating further movement might occur. A potentially active fault is an area showing evidence of surface displacement during Quaternary time or the last 2 million years.

The Special Studies Zone extends for 50 feet in width on either side of an identified fault or fault trace, or one-eighth mile on either side of a mapped fault trace, as designated by the State. When development for human occupancy is proposed within a Special Studies Zone a geotechnical investigation relating to seismic hazards is required and must be submitted to the City for review. The geotechnical study, prepared by a registered geologist, recommends grading and building procedures to reduce risk. The study is reviewed for adequacy by the City's consulting geologist prior to final project approvals. Development for human occupancy is not permitted within 50 feet of an identified fault. In addition, this plan prohibits the construction of attached garages within 50 feet of an identified fault.

The Hayward fault is the only area within the City currently designated as a Special Studies Zone by the State (Figure 10-4). Two other faults in Fremont, the Mission fault and the Silver Creek fault, were removed from this designation by the State due to lack of data indicating surface displacement.

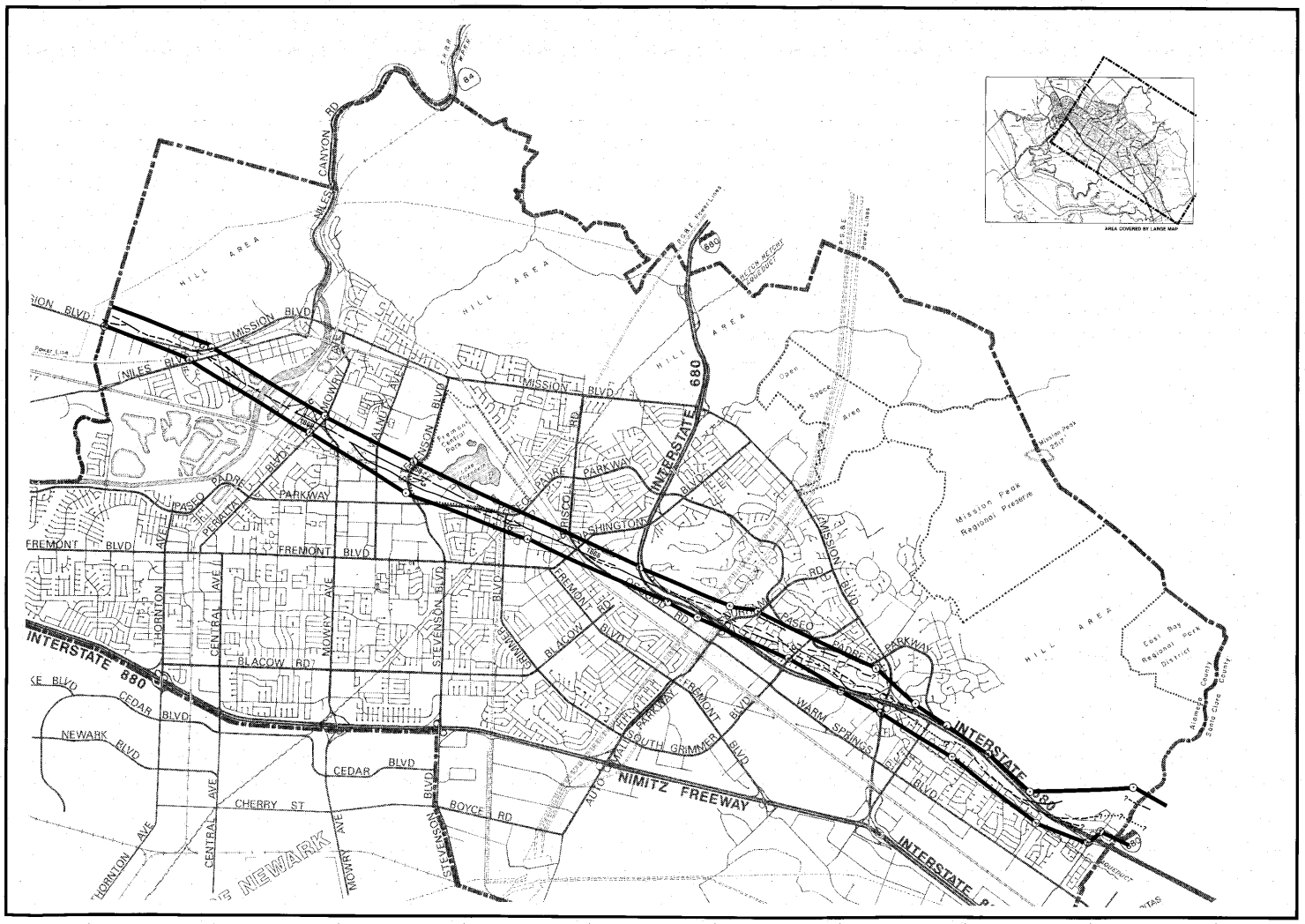


Figure 10-4 Seismic Zone

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Historical Seismicity

The Fremont area has been shaken by moderate to severe earthquakes an estimated sixty times in the recorded history of the area. Many of these earthquakes were centered on the San Andreas fault rather than the Hayward fault, but nonetheless caused damage in the East Bay.

Two major quakes generated by movement on the Hayward fault struck Fremont during the 1800's. The largest earthquake related to the Hayward fault in recent history occurred in 1933, centered near the mouth of Niles Canyon. According to the U.S. Geologic Survey and the State Geologist, the maximum earthquake intensity predicted to be produced by the Hayward fault would be an event of 7.5 magnitude on the Richter scale.

Because maximum quake magnitude is related to fault length, the highest magnitude quakes are expected on the San Andreas Fault where quakes above 7.5 have occurred and are expected to occur in the future. The 1906 earthquake on the San Andreas fault (estimated intensity 8.3 on the Richter Scale) caused considerable damage in Fremont, particularly to brick structures in Centerville and Irvington. The most recent major quake along the San Andreas fault occurred in October 1989. This earthquake, known as the Loma Prieta earthquake, had a magnitude of 7.1 on the Richter Scale, and caused groundshaking in Fremont. Locally, only minor structural damage was reported among historical structures and a few utility lines were ruptured. Some landslides triggered by the groundshaking were reported in uninhabited hillside areas. The rain which followed a few days after the quake further dislodged unstable landslide areas, creating mudslides in the hill area and on local streets.

The Calaveras fault branches from the San Andreas fault near Hollister and follows a somewhat more northerly course than the Hayward fault, passing through the Mount Hamilton-Diablo range. Movement on this fault has generated earthquakes felt in the Fremont area. In addition, activity on the Calaveras fault has caused displacement on the Hayward fault leading to minor damage to pavement in the Central Park area of City.

Historic information shows three moderate to strong earthquakes have occurred along the Calaveras fault: the 1861 San Ramon Valley earthquake, the 1979 Gilroy earthquake, and the 1984 Morgan Hill earthquake. Seismologists estimate a maximum credible earthquake of 7.0 for the Calaveras fault.

Areas of Potential Seismic Hazard

Relatively few residences, commercial or industrial buildings are found over or within 50 feet of the mapped trace within the City (see Figure 10-4, Seismic Zones Map). This is due to current siting requirements in the City's policies and regulations, and the marshy conditions found in areas along much of the Hayward fault trace. Any development over the Hayward Fault traces predated the establishment of Special Studies Zones. Much of the land traversed by the active Hayward fault trace is in public open space or is intended for such use in the future.

The City Government Building site in Central Park located between two fault traces, was studied thoroughly to determine the exact fault locations. When the building was developed in the late 1960's, it was specially designed to resist earthquake damage. However, there is considerably more information on the affects of earthquakes on buildings and standards have changed since the construction of the City Government Building. The City is now evaluating the building to determine if improvements are needed.

The Alameda County Library was designed to more current standards for resisting seismic activity. Future buildings in the Civic Center complex will require similar geotechnical and seismic safety study prior to construction. The south wing of the Central Park Community Center was found to be located on a trace of the Hayward fault and has been closed to public use due to structural damage and ground rupture.

Existing Structural Hazards Related to Seismic Activity

The majority of homes and buildings in Fremont are single-story, post-1950 wood frame structures which tend to fare well during earthquakes due to the flexibility of the building material, extensive bracing, and low elevation design. The relatively inflexible portions of buildings such as chimneys, porches, stucco, gas and electric lines, are all susceptible to damage in the event of moderate shaking during a quake.

Unreinforced masonry, stone, brick or block buildings are the most failure prone structures found in urban areas. In 1986, the State required cities to inventory potentially hazardous masonry buildings and develop and implement a mitigation program to reduce potential hazards.
The preliminary survey was conducted in July 1989 and estimated approximately 30-35 unreinforced masonry commercial or industrial buildings exist in the City. The majority of these were built in the early 1900's to 1940's, and are located in the older areas of Fremont such as the Irvington, Niles and Centerville Districts. Building owners were notified of the hazard. The State and City have not mandated structural strengthening of these buildings.

Buildings built before 1974 with concrete tilt-up walls and unreinforced concrete frames can often be damaged from ground shaking during an earthquake if proper precautions are not taken. Fremont has some pre-1974 tilt-up structures in the Central Business District, Central Area, and Industrial areas of the City. Mobile homes and structures not properly tied to foundations also tend to experience more than usual earthquake damage.

While it is impossible to guarantee the safety of any structure, a clearly defined and conscientiously enforced program of structural reinforcement greatly reduces the risk of injury and loss of life due to structural failure.

Transportation Routes

The Hayward fault is crossed by a number of local and region serving transportation routes. Many of these crossings are at grade and on level ground; therefore, while pavement and road bed might be damaged by ground rupture and displacement, a street or road could remain passable.

Crossings involving elevated structures, trackage or grade separations, such as freeway overpasses, would be affected more seriously by fault slippage or rupture. Existing facilities which might have to be closed because of fault activity are the Southern Pacific and Western Pacific railroad tracks at Shinn and near Union Street in Irvington, and the corridors through Niles Canyon. Major highway crossings on I-680, from the Alameda County-Santa Clara County boundary line north to the Washington Boulevard overcrossing in Fremont, are susceptible to significant damage in a major quake on the Hayward fault.

The BART system was designed to reduce the affect of seismic hazards, as shown by its ability to withstand the shaking of the Loma Prieta earthquake. However, the system crosses structurally poor soils and track distortion can be expected by even a moderately intense earthquake. If BART is extended to the south to the Warm Springs area, BART tracks would cross Walnut Avenue directly over the active Hayward fault trace. A grade separated intersection of Washington Boulevard and Driscoll Road also would be very near or on the Hayward fault.

Utility Systems

Most utility systems in the City have been built to respond to possible fault displacement. With the exception of sewer mains, the utility and pipeline systems in the Fremont area have valves to control or shut-off flows near the points of intersection with the Hayward fault. For example, the Hetch-Hetchy system was built with expansion joints where it crosses the Hayward fault. However, none of the pipeline systems crossing the fault in Fremont have been subjected to lateral offsets of more than several inches. It is not known whether any of these would withstand an offset of three feet, the amount reported following the 1868 Hayward fault quake. Soil liquefaction and ground subsidence, a secondary effect of seismic activity, could severely cripple some of these systems. The sewage treatment plant operated by the Union Sanitary District is located in an area of moderate to high liquefaction potential, as are the mains serving the plant. Figure 10-5, Pipelines and Utility Systems, shows the aqueducts, power lines and other main utilities.

Figure 10-5 Pipelines and Utility Systems

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Projections

San Andreas Fault

Studies of the frequency and intensity of earthquakes on the major fault system traversing the Bay Area suggest a pattern of recurrence. Geologists and seismologists generally concur that a major quake will occur on the San Andreas system on the average of once every 50 years, with such a quake (magnitude 8 or higher) likely to occur on the Bay Area segment of the fault on the average of once every 100 years. The October 1989 earthquake was not considered by seismologists to be of sufficient magnitude to alleviate the probability of another even more destructive quake occurring. As indicated by the records of the 1906 San Francisco earthquake, any major quake on the San Andreas system in the Bay Area region will cause severe shaking in Fremont.

Hayward Fault

Recurrence intervals for earthquakes on the Hayward fault are more difficult to predict than those for the San Andreas fault. Over the past few years geologists have revised predictions to suggest an increase in the probability of an earthquake on the Hayward fault. Recent data gathered by the U.S. Geological Survey suggests a 36 to 50 percent probability of a 7.5 (Richter Scale) earthquake on this fault over the next 30 years.

Calaveras Fault

Movement on the Calaveras fault is expected to have less impact on Fremont than the other two faults. The Calaveras fault is considered to be less active than the Hayward fault in the general vicinity of Fremont and, therefore, less likely to generate a major earthquake in this area. However, based on past occurrences, an earthquake of 7.0 (Richter Scale) on the Calaveras fault could be expected to cause ground distortion along traces of the Hayward fault, as well as intense shaking. The effects of such an earthquake would be similar to those of the 1868 Hayward earthquake (Richter Scale 6.8), including surface rupture of several feet northeast of Fremont in the Sunol Valley area.

Combined Probability

Although the potential for damage from earthquakes generally decrease as the distance from the epicenter increases, a major earthquake on any of the faults in the region has the potential to cause damage throughout the Bay Area. Recent (1990) studies by the United States Geological Service estimate a 67 percent combined probability of one or more large earthquakes of 7.0 magnitude (Richter Scale) occurring in the San Francisco Bay Region in the next 30 years.

Projected Impacts of Seismic Events

It is not possible to predict the level or extent of damage in the event of an earthquake. However, some types of damage can be anticipated. In residential areas, chimneys, porches and stucco may be damaged by moderate shaking during a quake. Older wood-frame structures weakened by rot or termite infestation may break away from their footings, rupturing utility connections. Mobile homes and structures not properly tied to foundations may also slip from foundations.

In commercial and industrial areas, a severe earthquake could lead to significant damage or collapse of unreinforced masonry, stone, brick or block buildings. Buildings built before 1974 with tilt-up walls and unreinforced concrete frames could also collapse.

Earthquakes have secondary impacts. One of the more serious secondary impacts would be fires resulting from ruptured electric and gas connections, collapsed chimneys and other damage. Addressing fires is complicated by the possibility of breaks in the water distribution system reducing or eliminating supply and water pressure. Fires and impassable roads would also severely complicate emergency response.

Any road closures would limit evacuation routes and timely response to emergencies. A severe quake would lead to the closure of BART and most rail lines in the City. However, most surface roads are expected to remain passable. Of the major highways, I-680 is the most susceptible to significant damage leading to closure. Eastern portions of the City's hills and Niles Canyon might be isolated by road closures due to slides and other damage.

As noted above, most utility systems in the City have been built to withstand fault displacement. However, in the event of a severe quake, most or all utility systems could be inoperable for several days.

FLOOD HAZARDS

Historically, the occurrence of flooding has been a benefit to agricultural soil, wildlife, and the general ecological balance of the community. Flooding becomes a hazard when the flow of water threatens life and damages property. Damages from flooding increase in proportion to the growth of urban development and as subdivisions locate on potential flood sites.

The primary causes of flooding are: 1) excessive surface runoff resulting from intense or heavy rainfall; 2) extremely high tides; and, 3) the failure of flood control or water supply structures such as levees or reservoirs.

When prolonged rainfall exceeds the absorption rate of the soil or the water storage capacity of the watershed, the excess must flow downstream. Although it is not possible to prevent the excessive rainfall which causes major floods, it is possible to manage areas subject to flooding for the protection of life and property. Through the use of hydrologic data in conjunction with regulatory and flood proofing measures, proper land use planning can be effective in the control of flooding and its potential adverse effects. This section describes conditions in Fremont related to flooding, and the actions taken to control it.

Setting

Historically, Alameda Creek has been the major source of freshwater flooding in Fremont. Beginning in 1962, various projects have reduced the threat of flooding, including channelization of Alameda Creek. The channel has a holding capacity in excess of what is required to hold a flood that is estimated to occur once every 100 years (a “100-year flood”).

Other flood hazards in the Fremont area have been significantly reduced through projects of the Alameda County Flood Control and Water Conservation District and the U.S. Army Corps of Engineers (see Public Facilities Chapter for a discussion of the District). The Flood Control District facilities, which include various types of channel improvements for the eight smaller creeks and drainways that flow out of the hills and across the Bay plain, are designed to handle flooding up to and including the 50-year flood (i.e., a flood that can be expected to occur once in 50 years). The District is currently working on improvements needed to protect developed areas from 100-year floods.

Because most flood control channels have been constructed to withstand the 50-year flood, some areas of the City are still prone to flooding. These areas are discussed in the following section (see Inundation Hazards Map, Figure 10-6).

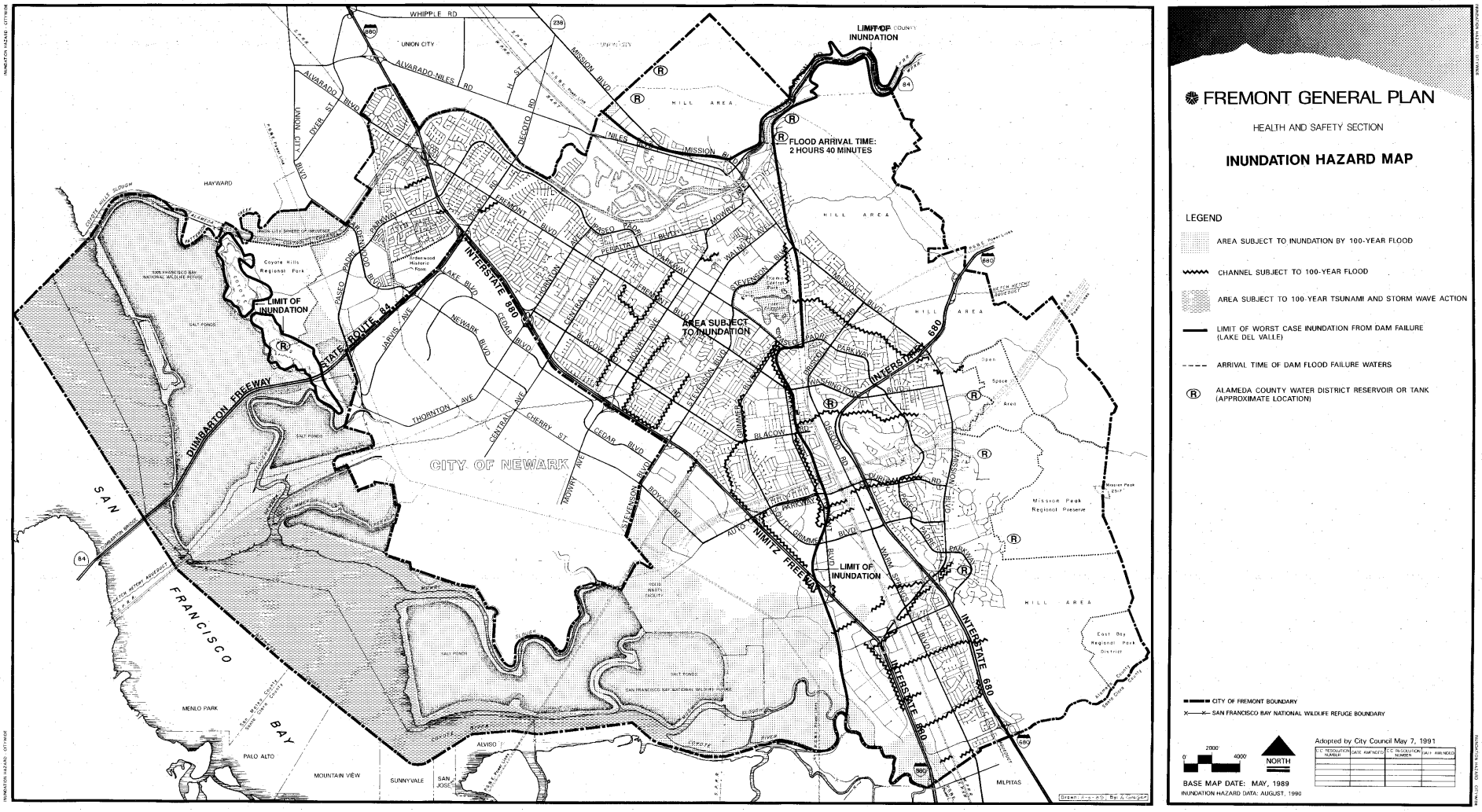

Fig 10-6 Inundation Hazards Map

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Regulations Related to Flooding

The City is a participant in the National Flood Insurance Program operated by the Federal Insurance Administration of the Department of Housing and Urban Development. In addition to insuring property owners against losses due to flooding, the program requires local governments to control development in a manner which minimizes the risk of flood damage.

Maps of 100-year flood inundation areas developed for the Insurance Program show the boundaries of the 100-year and 500-year floods. The 100-year flood has been adopted by Federal Emergency Management Agency (FEMA), and is used by the City of Fremont, as the base flood for the purposes of floodplain management.

Fremont ordinances regulate development which would reduce the water-carrying capacities of watercourses. Hillside development is analyzed for its impact on downstream drainage. Designated areas including ponds and wetlands are reserved for use as storm water holding facilities where runoff can be directed during peak flow to reduce flooding downstream. Development plans are routed to the Alameda County Flood Control and Conservation District for comments as to impacts on the flood control systems and facilities.

Fremont ordinances also control development in areas prone to flooding. All construction in these areas must be raised to an elevation of 1.25 feet above the 100-year flood zone as defined for that location. An area may be removed from the 100-year flood zone and its regulations if levees and other flood control projects are constructed and are sufficient for protection in the event of a 100-year flood.

Flood Prone Areas

Flooding in excess of the 100-year flood will cause some inundation of low-lying flatland areas of the City. Figure 10-6, Inundation Hazards Map shows the areas which are expected to be affected during a 100-year flood. Most of the areas prone to historical flooding are located in the western portions of the City and have been designated primarily for permanent open space uses such as salt evaporators, salt marsh, or parks. A 100-year or greater flood would extend roughly one-half mile inland from the Coyote Hills covering land designated for agricultural use. Flooding from a 100-year or greater flood would affect portions of the Northern Plain planning area, and portions of the City's industrial area west of I-880, south of Warren Avenue.

Other areas of the City where inundation from a 100-year flood is projected include the narrow Alameda Creek floodplain in Niles Canyon; the area surrounding Lake Elizabeth, extending into the Mission Valley

subdivision; Olive Avenue and vicinity east of Interstate 680; the Crandall Creek area west of Interstate 880; the southeast end of the former Skysailing Airport and Fremont Raceway; and the KGO radio transmitter. There continues to be localized flooding problems along the urban fringe near the base of the hills and in scattered flat land areas.

Flooding Related to Earthquakes, Dam (Inundation Areas) or Tank Failure

Flooding could accompany an earthquake under the following conditions: a dam or storage tank fails; the earthquake creates severe groundshaking resulting in a wave or seiche in a reservoir and causing a dam to fail or overflow the surrounding area; a stream is dammed by a landslide and water volume exceeds channel capacity; or an earthquake-triggered landslide into a reservoir creates an overflow. Channels and water courses with earthen banks and levees are particularly vulnerable and could collapse in a major earthquake resulting in partial or complete blockage of channels causing flooding upstream of the impoundment. Lift stations and tidegates could be damaged and shoreline levees collapse, eliminating or impairing the control capabilities of the system. Levees are especially susceptible to rapid settlement due to liquefaction or horizontal spreading of underlying soils.

Damaging seiches generated by seismic activity would not be produced by the small, shallow lakes and ponds in the Fremont area. The danger to Fremont from seiches would be from the overtopping or failure of dams at the large reservoirs in the Sunol area which could produce flooding through Niles Canyon.

Dam failures are one of the greatest threats to life and property of all natural disasters because of the large populations typically exposed to danger. Failure of a dam on Alameda Creek or on a tributary to the creek could release a large volume of water into Niles Canyon, exposing the population of Fremont, Newark and Union City to a major hazard, and destroying property and essential public facilities. While dam failure is highly unlikely, the dams on the Del Valle and San Antonio Reservoirs are more serious threats than the dam on the Calaveras Reservoir which has recently been strengthened. Dams are regularly inspected by the California Division of Safety of Dams, and response plans prepared by the division in the event of inundation (see the Health and Safety Chapter Background Report for inundation maps).

It would take an estimated ninety minutes (for the Turner Dam on the San Antonio Reservoir) to 160 minutes (for Del Valle) for flood waters

to reach the mouth of Niles Canyon where it could spread into populated areas. Flood hazards would be most severe in winter, when streams and reservoirs are full.

The failure of water storage tanks releasing a large volume of water over down-slope areas is a local land use planning concern. The Alameda County Water District has two water storage tanks and five reservoirs located on the lower slopes of the eastern Hill Face. Additionally, there are scattered ponds in the hill area. Should one tank fail or pond overflow, there is the possibility that a large volume of water could suddenly be released over downslope areas. Most water tanks and reservoirs are located in areas away from residential development, so the released water would pond on flatland.

Tsunamis

Tsunamis or seismic sea waves (commonly called "tidal waves") are waves generated in bodies of water by earthquake shaking, underwater earth slides, subsidence or uplifting, or slides into reservoirs, lakes or bays. Tsunamis generated by Pacific rim earthquakes have not produced damaging waves on the shoreline of the South Bay despite runups of 7-10 feet at the Golden Gate. USGS has predicted the areas of the San Francisco Bay Region most likely to be inundated by waves are marshlands, tidal flats, and former bay margin lands not artificially filled but still at or below sea level. Based on this information, tsunami hazards would be limited to the approach to the Dumbarton Bridge (most of the bridge is now elevated above the flood inundation line) and the shoreline area almost entirely within the National Wildlife Refuge and designated for permanent open space uses. Inundation in the area of Mowry slough would affect the Hetch-Hetchy aqueduct and Southern Pacific Railroad track crossing the Bay from Dumbarton Point to East Palo Alto. Tsunamis do not create a hazard or risk in the developed area of Fremont.

Projections

Most of the urbanized areas of the City are now outside the 100-year flood zone. For those areas within the flood zone the Flood Control District is continuing to make improvements to increase protection. Industrial zoned areas near the Baylands in western Fremont can be expected to be protected from flooding through projects constructed as part of new development.

Flooding, dam failures, tsunamis and other natural disasters cannot be predicted. The City's development ordinances are oriented toward

minimizing the damage when a disaster occurs. Its emergency planning addresses the need to plan for the needs of residents affected by such disasters including evacuation plans and provision of adequate warning, when feasible. These plans are discussed in the Emergency Preparedness section of this Chapter.

As more hillside land in eastern Fremont is proposed for development, consideration must be given to the potential impacts of water storage tank failure on existing and proposed development.

FIRE HAZARDS AND EMERGENCY RESPONSE

The City's Fire Department is not only called on to fight fires, but is often the first agency called in the event of a medical or other emergency. As a result, the role and function of the Fire Department has broadened beyond its traditional role of fighting fires to include response to other types of emergencies, particularly those related to medical and hazardous materials. Over the past 5 years, fire has accounted for approximately 9% of the calls to the Fire Department. This includes buildings, vehicles, grass, and all other types of fires. About 60% of the calls were for other emergencies and the remaining 31% were for citizen assistance.

This section discusses the City's current efforts to minimize risk from fire and to respond to fires and other types of emergencies when they occur. The role of the Fire Department in regards to hazardous materials is summarized in this section; however, the overall response of the City to hazardous materials incidents is discussed in the "Hazardous Materials" section of this Chapter.

Since adoption of the 1991 General Plan, several changes have occurred to strengthen the City of Fremont's fire prevention program. The California Building Code (CBC) and the California Fire Code (CFC), both adopted with local amendments by the City of Fremont, now require that (with few exceptions) all new construction (including residential, commercial and industrial) must include a fire sprinkler system or an automatic fire extinguishing system (AFES). Increases in square footage, changes in use, or damage to a structure due to fire or disasters may also require fire sprinkler or automatic fire extinguishing systems to be installed. Historically, regulations required two points of ingress and egress when 80 or more dwelling units are served in a development. The UFC now requires two points of ingress and egress, or enhanced fire suppression systems, when 25 or more dwelling units are served in a development.

Setting

Emergency Response

When emergencies occur the City seeks to ensure there is adequate and timely response. Because quick emergency response is critical in fire suppression and other emergencies, the City Council established goal is a five minute 30 second response for 90 percent of all emergency calls. The five minute 30 second response goal is based on the rate fire spreads and the length of time a non breathing person can survive. A fire will double in size every minute it is allowed to burn. According to the American Heart Association, irreversible brain damage occurs within four to six minutes of a patient becoming pulseless and non-breathing with cardiac defibrillation

being most effective when delivered prior to six minutes. Response time includes drive time and turn-out time. (Turn-out time includes fire station receipt of alarm, fire crew readiness and fire apparatus initiation of travel.)

In addition to the response time goal for a single company response, a second response time goal described as 'Concentration' is equally important. Concentration is defined as the amount of time required to place a full alarm assignment (minimum 14 firefighters) on the scene of all structure fires. The number of firefighters (14) is significant because it is the minimum number required to carry out all of the critical tasks at a structure fire safely and efficiently.

In Fremont, the Fire Department goal is to respond to all structure fires such that the full assignment (minimum of 14 firefighters) will arrive at the scene within nine (9) minutes, thirty (30) seconds, (1 minute, 30 second turnout time and 8 minute travel time), 90 percent of the time.

Fire Prevention

All proposed development projects in the City are reviewed to ensure appropriate measures are taken to minimize risk from fire. Projects are reviewed for adequacy of access, design features (setbacks and clearance between buildings), and compliance with code requirements. Access is particularly important to ensure fire and other emergency apparatus can reach fires, and people can escape in the event of an emergency. Provision of alternate access routes to developed areas is an important principle and is becoming more important as the community develops.

Buildings 75 feet (approximately seven stories) or more in height are considered high rise under the California Building Code (CBC). Sprinklers and other safety features are required in these buildings. Sprinklers are also required in most new building construction (residential, commercial and industrial). Increases in square footage, changes of use, or damage to a structure due to fire or disasters may also require that a fire sprinkler or similar system be installed.

Despite continuing improvements in response and equipment, some areas and types of buildings present special risks and problems in fire prevention and emergency response. These are described below.

High rise and High Intensity Buildings

High rise buildings present special problems of access and emergency exit during fires or other emergencies. Moving fire fighters and equipment up stairways to the upper stories increases response time and delays emergency access. To reduce the risk of death or injury related to fire in a

high rise building, built-in protection such as early warning and detection systems, automatic sprinklers, fire resistive materials and appropriate design of structures is required.

Higher density residential and commercial development presents some increased fire risk due to the intensity of use and greater chance of fire spreading from one living unit or business to another. When high density residential or commercial development is proposed the Fire Department reviews development plans for adequacy of water supply, noncombustible roofing, one-hour rated exterior walls, adequacy of exits and entrances, fire lanes (if required), and sufficient clearance between structures.

Industrial Fires and Hazardous Material Release

Industrial fires and hazardous material releases present special hazards, both to the firefighter and the community. Industrial fires may include hazardous substances, and the fire may spread the hazardous material into the environment, endangering other areas in the community. The City has a Hazardous Incident Team (HIT) specially trained to make a preliminary assessment of the type of material involved in an emergency. Additionally, one fire apparatus has specialized equipment necessary for hazardous material incident response.

The City maintains records of the type of hazardous materials used and stored in the City. Users are required to comply with the Hazardous Materials Ordinance and permitting process. Of particular concern are those facilities which use extremely hazardous materials in production processes. Fires, explosions or releases of hazardous materials could block streets, damage adjacent properties and require evacuation of the surrounding population (see below, Hazardous Materials, for further discussion).

Rail and highway transport of hazardous materials also present risks to the community due to accidents. The City has limited jurisdiction over the transport of these materials in regard to the designation of roads where they can be transported. The City cannot control rail-lines or State highways and freeways where the State has authority.

Residential Areas

Several residential areas, and especially recently developed areas, are outside of where the City can currently meet its 5 minute 30 second response goal. However, planned improvements to fire service will correct this situation for most residential areas. Residential areas where this goal will not be achieved after making these improvements is discussed under “Projections.”

Hill Development

Residential development in the hills present special risks due to the proximity of undeveloped land where fires can easily spread and the time it takes for the Fire Department to respond in these areas. For these areas the City has special development requirements to minimize the risk of fire, including provision of adequate water supply, noncombustible roofing, one-hour rated exterior walls, irrigated greenbelt (wetbands) barriers, firebreaks, sufficient clearance between structures, and drought and fire-resistant irrigated landscaping. Fire roads and firebreaks must also be provided.

Regions above and below the "Toe of the Hill" (see Land Use Chapter for definition) present problems due to the dry, windy climatic conditions in addition to the rugged terrain and highly flammable native brush. These areas are particularly susceptible to wildfire, an uncontrollable brush fire fueled by this vegetation. The scattered existing homes in this area are generally outside the 5 minute 30 second response time of the City. Limited accessibility for emergency equipment could complicate emergency response and evacuation. The low density of housing in area limits the number of people and structures that could potentially contribute to the problem, as well as recent requirements for new development to include more defensible space against the spread of fire by the incorporation of "wet bands", which are green, watered, low flammability landscaping surrounding structures.

Generally, all of the area east of Mission Boulevard is designated a Critical Fire Area by the Fire Department from May through October.

Peakload Water Requirements

The peakload water requirement, or required water supply needed for fire protection, is closely related to land use. The quantity of water needed to fight a fire varies depending on the type of development, degree of fire hazard, and building occupancy. Peakload water requirements vary from 1,500 gallons per minute (gpm) for low density residential areas, up to 12,000 gpm in commercial and industrial areas.

A minimum residual pressure of 20 pounds per square inch (psi) should remain in the system while the required gallons per minute are flowing. This requires fire hydrants which meet the standards established by the Alameda County Water District and the City, and also, adequately sized water mains.

The Insurance Service Organization rates all cities for their emergency response capabilities and the availability of peak-load water to fight fires. The rating affects insurance costs for private property owners. The rating

ranges from 1 (highest rating) to 9 (lowest). Fremont has received a rating of two. The Alameda County Water District periodically runs fire flow tests in the City to verify that water pressure is maintained. If tests show pressure is substandard, improvement of the water system becomes a requirement for water service to the proposed development or building.

Some portions of Niles currently do not conform to the minimal residual water flow of 20 psi because of inadequately sized water mains which existed prior to Fremont's incorporation. For this reason, Niles Boulevard has recently been designated as a Hazardous Fire Area. New construction will be required to meet special construction standards to deal with the increased hazard. New development in the hill areas is also required to meet fire department standards and conditions including improved water service and special design features discussed previously.

Minimum Road Widths

Emergency equipment must be able to reach a site of an emergency and people in an area must be able to escape from danger. Roads must have sufficient width to allow fire and other emergency equipment to pass. To ensure sufficient access in the event of emergencies, Fremont requires two ingress-egress roads in developments that can accommodate fire and other emergency vehicles when 25 or more dwelling units are served. Requirements have been established for minimum road width and overhead clearance, for all emergency access roads. The minimum road width for public streets varies depending on type of road (see Transportation Chapter for more detail). The narrowest public roads are cul-de-sac streets which must be at least 32 feet wide. Private roadways must generally be at least 28 feet wide in areas where development is less than 4 stories, and 36 feet where development is greater than 4 stories. Emergency access roads without auto traffic must be 20 feet wide and 28 feet wide where there are fire hydrants.

Overhead clearance, turning radii and turnaround areas are also regulated to insure emergency vehicle access. Emergency access roads must have at least 13 feet 6 inches of overhead clearance. The minimum required outside turning radius varies depending on planned use. Emergency access roads designed to accommodate an Engine Company must have a minimum outside radius of 38 feet and inside turning radius of 20 feet. Emergency access roads designed to accommodate a Ladder Company must have a minimum outside turning radius of 50 feet and inside turning radius of 30 feet. Fire lanes, emergency access roads, dead end streets and alleys must end in a cul-de-sac or other approved turning area.

Emergency Response

The City's Fire Department also responds to medical emergencies, which by far, are the most common type of emergency call. Nearly 60% of all emergency calls received by the Fire Department in 2003, were for medical emergencies. The Fire Department is responsible for providing emergency pre-hospital care throughout the City. All members of engine and truck companies are certified emergency medical technicians and at least one member is a paramedic.

Emergency Training

The City's Fire Department also responds to medical emergencies, which are by far the most common type of emergency call. Nearly 60% of all emergency calls received by the Fire Department in 2003, were for medical emergencies. The Fire Department is responsible for providing emergency pre-hospital care throughout the City. All members of engine and truck companies are certified emergency medical technicians and at least one member is a paramedic.

Projections

Fire Prevention and Response Time

In November 2002, the Fremont voters passed the Fire Safety Bond Measure. This provides for seismic renovation and associated remodeling for seven fire stations, replacement of three fire stations with new facilities (two will be relocated) and a Fire Department Training Center.

Other proposed improvements include a new station located west of the freeway in the Industrial Area when call volume dictates.

Although response time will be improved with an additional stations, there are still areas of the City which will be outside the 5 minute 30 second response time area. These are shown in Figure 10-8. There is an ongoing evaluation of fire response needs throughout the City.

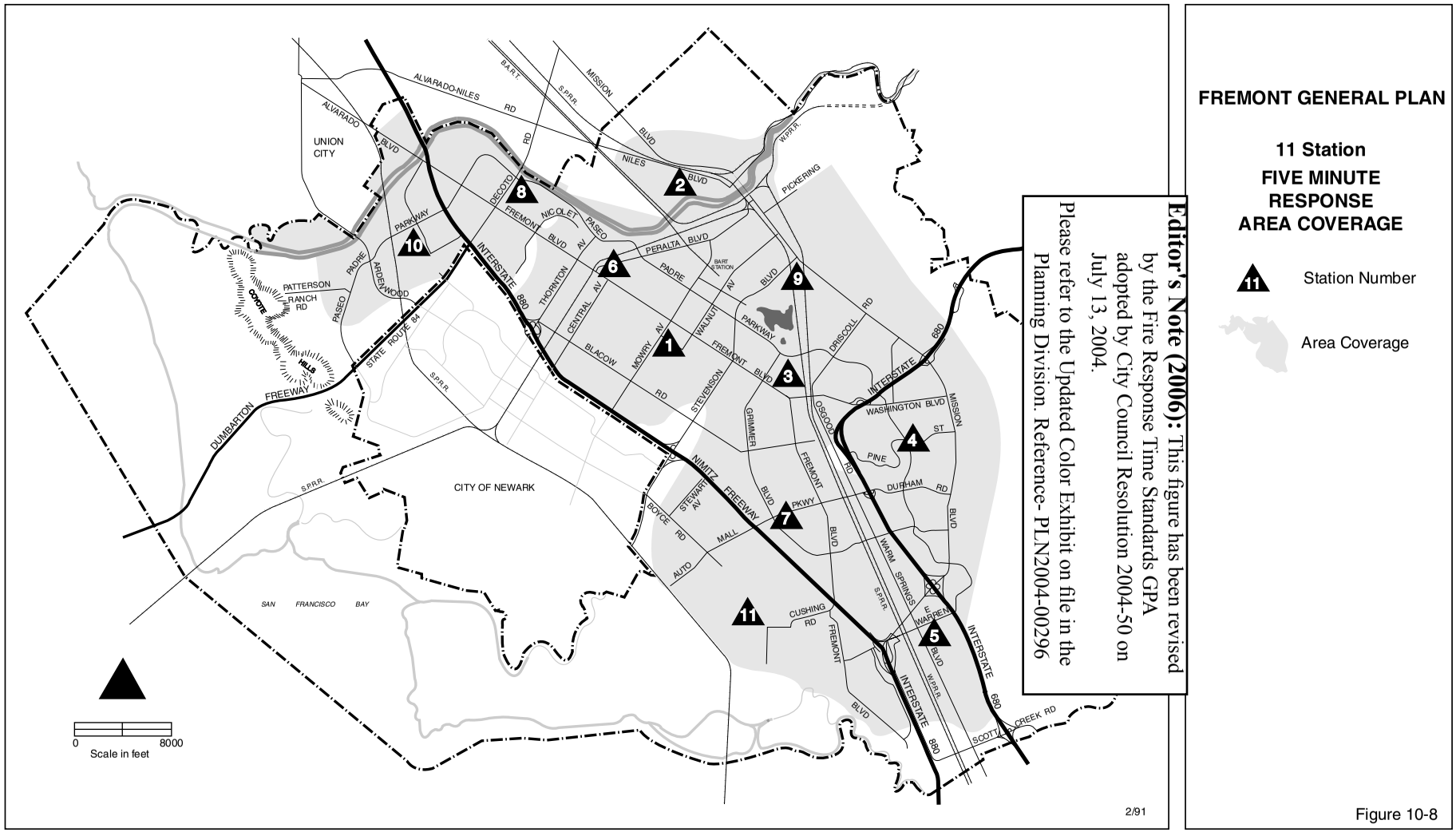


Figure 10-8

*Figure 10-8 ***Superceded*** 11 Fire Station Five Minute Response Area Coverage*

Amended 7/13/04

High Rise and High Intensity Buildings

As development proceeds in the City there is likely to be additional construction of taller buildings, especially in the Central Business District area. Higher densities can also be expected. Project review to assess compliance with regulations and standards will continue to be especially important with high rise and high density commercial or residential development.

Industrial Fires and Hazardous Material Release

Industrial growth may increase the risk related to fires involving hazardous materials. Many industries use hazardous and flammable chemicals. A new fire station planned in the southern Industrial Area of Fremont west of the Nimitz Freeway (I-880) should help to provide improved service and response for this area when warranted by additional development. Additionally, large industrial complexes are often required by the City to have their own highly trained team of hazardous materials personnel and equipment to reduce the risk to employees and property (see discussion under Hazardous Materials, below).

Residential Areas

Additional development along the base of Fremont's eastern hills expected over the next few years. Most of these areas are within the expected 5 minute 30 second response time for the City, but face special hazards due to their relative isolation and proximity to open brush and grassland. The City's current fire prevention standards for developments will reduce the fire risk in these areas.

Development above the Toe of the Hill is controlled by the provisions of the Hill Area initiative. Development is limited to one unit per 20 acres on land within the City of Fremont on January 1, 2002.

HAZARDOUS MATERIALS AND WASTE

The management of hazardous materials has been an increasingly important consideration in land use planning over the last decade due to a growing community awareness of the threat they pose to a community. Accidental release of hazardous materials into the atmosphere or onto the ground during a fire, earthquake, traffic accident or other disaster could threaten the health and safety of workers and of nearby residents. During a major disaster, such materials could spill onto adjacent properties or clouds of toxic gas could spread through large areas of the City. All levels of government have become increasingly active in regulating the storage, use and transport of these materials. The City's efforts are discussed below.

Setting

Fremont has experienced rapid industrial growth in recent years. Much of this growth has been in high technology industries, many of which use hazardous materials. With the increase in quantity and hazard of regulated substances, the potential risks to the community have increased. While hazardous substances pose a potential threat for any part of the City, residential areas in closest proximity to an industrial area face an increased risk of exposure during an accidental release of a toxic substance, spill or fire.

The transport of materials within and through the City poses a widespread threat, since accidents could occur on any of the City's transportation corridors, posing a risk to adjacent neighborhoods and businesses.

In addition to managing routine use of hazardous substances, the City must also seek to ensure the clean-up of contaminated areas where those substances have been used, stored or disposed of in the past.

The use, control and management of hazardous materials are discussed below, as well as the City's plan to respond to an emergency resulting from an accidental release of a hazardous material into the environment.

Areas of Hazardous Materials Use

Over 1,600 identified businesses require regulation under the City's Hazardous Materials ordinances. Most hazardous materials use occurs in the industrial areas of the City. Increases in the volume and changes in the character of such materials can be expected due to new industrial and commercial development.

Residential areas closest to major industrial development areas are at the greatest risk of being affected by an accidental release of hazardous substances. Some neighborhoods in the Warm Springs and Northern Plains Planning Area, as well as some neighborhoods in the city of Newark are close to industrial areas. In addition, hazardous materials are also found near residential areas in smaller industrial areas in Niles and Centerville.

Transportation of Hazardous Materials and Waste

An accidental spill of a hazardous material can occur almost anywhere in the City, endangering life and property and/or temporarily closing a major transportation arterial. The City only has jurisdiction over what is transported on City streets within the City limits. The State controls the freeways, highways and railroads. The main highway routes for hazardous materials through Fremont are Interstate 880 and 680. Interstate 880 is considered the primary transport route for much of the hazardous waste produced in Alameda County.

Federal, State and local laws and regulations on transport of hazardous materials assign specific duties and responsibilities to the producers, transporters and receivers of hazardous substances. These regulations also define the responsibilities of the various governmental agencies for regulating and monitoring the transport of the material or waste, and for emergency response to spills in transit. Should a spill occur on one of the State highways through the City, the City's Fire Department would respond initially with the clean-up operation usually the responsibility of CALTRANS or the Coast Guard.

A major concern to the City when a hazardous chemical spill occurs is the possibility of surface and groundwater contamination. Floodplains and creeks lie in close proximity to some primary transportation routes and can become contaminated quickly between the time a spill occurs and the clean-up process begins. Because of the importance of Alameda Creek for the City's water supply, most vehicles carrying hazardous materials are banned through Niles Canyon on Route 84. However, the railroad which also runs through this area is still permitted to transport such materials.

Hazardous Material Management

Regulation and management of hazardous materials are administered by the City of Fremont, County, State, and Federal agencies and non-governmental organizations. Numerous regulatory requirements govern hazardous materials and wastes in water, land and air, and some regulations overlap.

The City regulates the management, handling and storage of hazardous materials. Fremont controls the underground storage of hazardous materials, establishes permitting procedures, responsibility for enforcement and compliance scheduling. This issue is critical in Fremont where leakage of hazardous substances from underground tanks could contaminate the aquifer underlying the City which supplies the City's drinking water. (See the Water Resources Section of the Natural Resources Chapter for more discussion on leaking underground tanks as they relate to groundwater.)

Hazardous Material Emergency Response

The State Health and Safety Code requires the City to adopt a Hazardous Material Area Plan for Emergency Response. This plan is for emergency preparedness in the event of a disaster related to hazardous material use, storage or movement. The Fremont City Council adopted a plan in January 1987 (subsequently amended) and it has been approved by the State Office of Emergency Services.

The plan sets forth responsibilities within City government for responding to a hazardous materials emergency. The plan also includes a detailed checklist for actions, training programs, procedures for requesting State and Federal funding assistance and incident reporting procedures. Also included in the plan are maps showing where significant quantities of hazardous materials are stored, evacuation routes from the facilities, and the location of sensitive receptors such as schools, hospitals, and nursing homes.

The Hazardous Material Area Plan for Emergency Response provides a more detailed description of response actions in the event of a hazardous materials emergency than the City's Emergency Plan (discussed in the next section).

Hazardous Waste Management Plan

Every city and county is required by State law to adopt a Hazardous Waste Management Plan. If the county plan is applicable and contains sufficient detail for the city's use, a city may adopt the county plan. Alameda County's plan, prepared in 1989, identified general areas throughout the County, based on siting and environmental criteria, which are considered appropriate for the siting of new off site hazardous waste transfer, storage, or disposal facilities. Several possible sites in the City may meet the Plan's criteria as potential treatment, storage, or disposal facilities for hazardous wastes. No specific sites in Fremont have been identified.

The City Council adopted the County plan by resolution on July 25, 1989. The County plan is still under review at the State level and may require revision. After State approval, a General Plan amendment and zoning ordinance revision will be necessary to ensure conformance with the plan. The City is also required to adopt a hazardous waste minimization plan.

Site Analysis and Clean-up

Prior to the acceptance of a development project application, the applicant must verify the site does not have any significant environmental contamination and that it is not listed on the current Hazardous Waste and Substances Sites List published by the Governor's Office of Planning and Research.

Projections

Areas of Hazardous Materials Use

High-tech manufacturing often uses hazardous materials or produces hazardous wastes. A significant increase in industrial uses is expected in Fremont, and especially by high-tech oriented industries, leading to a proportional increase in the use of hazardous materials. Continued monitoring, management and enforcement of existing regulations will be required to reduce the risks posed by industrial growth. In addition, as the City's residential land supply has developed, pressure has grown to permit residential development in areas formerly planned for industrial uses. If residential development is to occur near industrial areas a complete environmental and hazardous material assessment will be necessary.

Transportation of Hazardous Materials and Waste

An increase in industrial development also implies an increase in the amount of hazardous substances transported within the City. The City should periodically review its truck routes and other controls over the transport of hazardous materials to minimize risk to the community from any accidental spill.

Hazardous Materials Regulation and Emergency Response

The City's management and emergency response plans for hazardous materials are approved by the State. In the future, maintenance of the plan, appropriate training and periodic review and updating of the plan will ensure the City is up-to-date in its management of hazardous materials and in its response to emergencies.

EMERGENCY PREPAREDNESS

Effective safety planning involves both the development of regulations to prevent and/or reduce hazards, and the preparation of plans to deal with emergencies should they arise. While prevention is the most effective method of protecting the public and property from imminent danger, the City must be prepared for emergencies.

The City's response to emergency depends on the scale of the emergency faced by the community. Small scale emergencies occur daily within the City as a result of medical emergencies, traffic accidents and the like. For these types of emergencies, the usual first response is by the City's Police or Fire Department. An estimated 60 percent of the calls received by the Fire Department are for medical response and 26 percent are for other citizen response calls, many of which are related to some perceived emergency need.

For disasters or other emergencies which threaten significant portions of the community, a different level of emergency response planning is required. The State requires every community to prepare a local emergency preparedness plan to respond to such natural disasters as floods and earthquakes, and man-made disasters such as a hazardous materials spill. These plans are to be reviewed and updated every four years and approved by the State Office of Emergency Services. This section of this Chapter focuses on the City's Emergency Plan.

Setting

The California Office of Emergency Service is responsible for preparing the California State Emergency Plan and for coordinating and supporting emergency services provided by local governments. The responsibility for immediate response to emergencies, such as fires and earthquakes, rests with local government agencies and segments of the private sector, with support services provided by other jurisdictions and/or State and Federal agencies. In the event of a major emergency, the normal governmental organization converts to one more effective in coping with potential public health and safety problems.

Plan Implementation and Responsibility

The City of Fremont's Emergency Plan (1989) was developed in compliance with State requirements. The plan is a comprehensive approach to emergency preparedness, addressing possible hazards which might result from an emergency such as a natural disaster, technological incident, nuclear defense, and civil disorder or terrorism. The Plan provides the basic guidelines for organization, authority, duties, services and staff during a disaster. The Plan is intended to be coordinated

with State, regional and County emergency plans. The role of every organization, agency or activity expected to contribute to an emergency response is identified in the plan. The plan is designed to not only consider the affects of a single natural catastrophe (such as an earthquake), but emergency problems which often result from major disasters. For example, an earthquake could also cause massive failure of an upstream dam or loss of water pressure needed to fight fires, each of which require a specific type of response to reduce community risk.

To improve the City's performance in the event of disaster, a Disaster Council has been established within the City to assess emergency response to actual incidents. This Council is comprised of staff from various departments, and representatives of the School and Hospital Districts.

Emergency Facilities

In the event of a large scale disaster or emergency, the City's Emergency Operations Center (EOC) would be activated. Several primary emergency facilities could be opened to provide other types of community assistance in the event of an emergency. These facilities would be established in existing City buildings such as the City Government Building, all fire stations, various community centers, the Fremont Main Library, the Animal Shelter, the Senior Multi-Service Center and the Liberty Street Annex. The type of use for each facility would depend on the disaster and the particular needs of the community at that time. Other critical facilities which could be utilized in an emergency are shown on Figure 10-9, Critical Facilities.

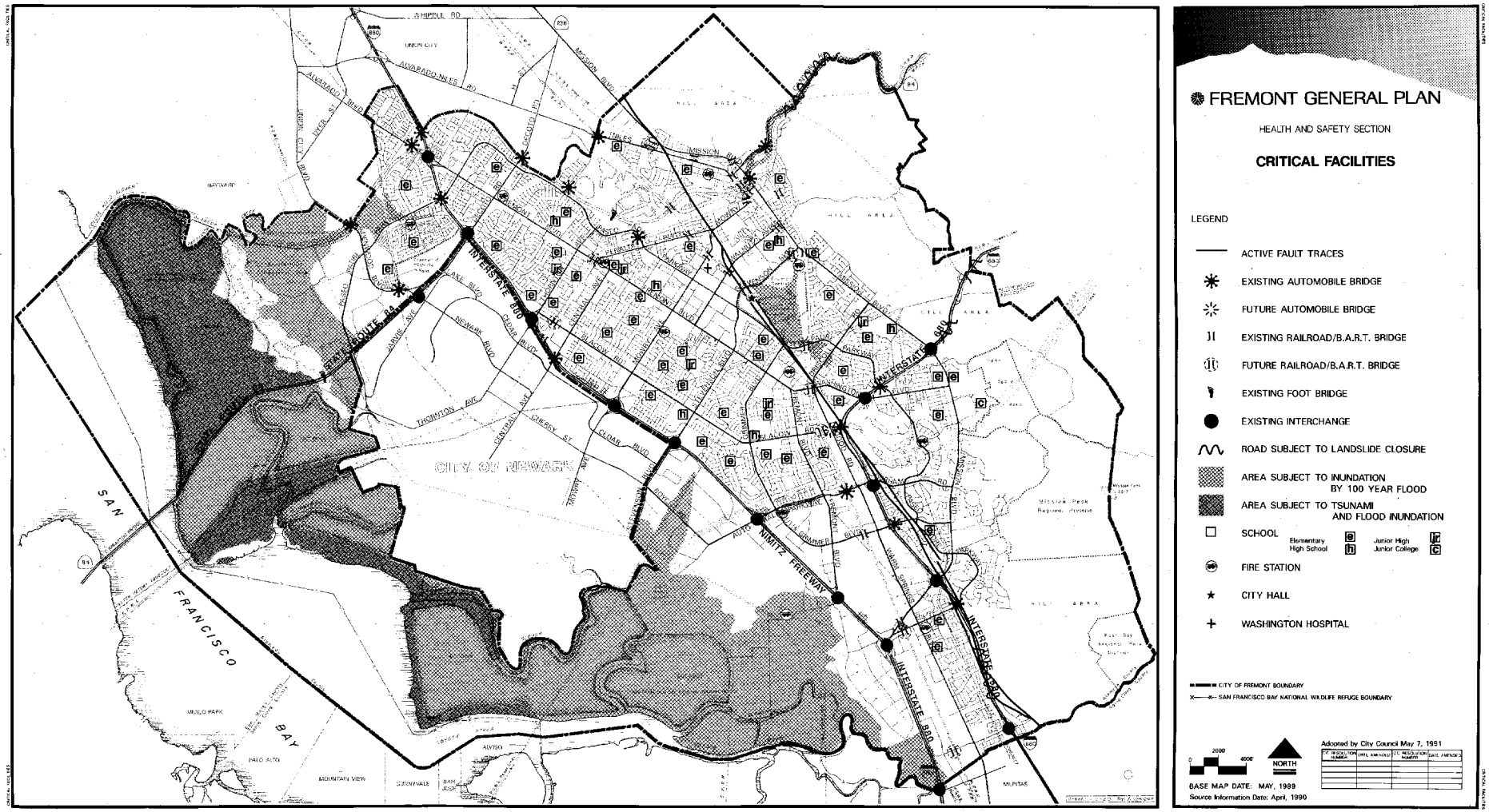


Figure 10-9 Critical Facilites

Chapter 10: Health and Safety

Critical Facilities

There are a number of potential sites for emergency shelters in the event of a natural disaster or other emergency. The type of shelter and locations vary depending upon the type and geographic area of the disaster. In the event of a natural disaster such as an earthquake, temporary shelters might be used, while in the event of a disaster involving toxic gasses, evacuation or shelter in buildings might be used. Responsibility for establishing emergency shelters rests with the American Red Cross which has a national charter to provide functions relating to sheltering for natural and technological disasters.

Emergency Evacuation Routes

Fremont's Emergency Plan provides policies and procedures for the evacuation, dispersal, or relocation of people from hazardous areas during natural disasters to less threatened areas. The plan also describes the organization and responsibilities for conducting movement operations. The need for evacuation routes and the appropriate routes will vary for each type of disaster. For example, if the James Turner dam fails, evacuation would be directed away from Niles Canyon, the most likely course for floodwater. On the other hand, Niles Canyon would be an appropriate evacuation route for other types of disasters. Evacuation routes suited for different types of potential disasters are shown in the City's Emergency Plan (described above).

Several areas of the City could become isolated during an emergency due to road closure. Because routes may be impassable, alternate evacuation routes out of potentially affected areas are also suggested in the Emergency Plan.

Projections

Cities can identify potential disasters and have an adequate plan and appropriately trained personnel to respond when one occurs. The City's current efforts to prepare for disaster and to learn from past efforts should improve the City's performance. Maintenance of current training programs and regular review and updating of the City's emergency plan will be necessary.

NOISE

Excessive noise is a health concern for a community. At particularly high levels noise itself can have damaging affects on health. At lower levels noise can cause irritability, wakefulness and other conditions which have health implications and generally affect the quality of life. The purpose of this section of the Health and Safety Chapter is to appraise noise problems and provide guidance to avoid these problems in the future. Good land use planning requires consideration of the impacts of environmental noise. This section follows the guidelines adopted by the State Office of Noise Control (section 46050.1 of the Health and Safety Code) and meets the requirements in section 65302(f) of the California Government Code. The "Setting" and "Projections" section summarize information found in the Noise Background Report, hereby incorporated by reference.

Setting

Noise Characteristics

Noise is defined as unwanted sound. The magnitude of sound is measured in terms of decibels (dB). When sound is measured, electronic filters are usually used to emphasize the various frequencies or pitches people hear. The "A" filter is the most common, and is indicated by dB(A). Human hearing ranges from 0 dB(A) to 140-160 db(A), with pain occurring at around 120 dB(A).

Sound varies throughout the day due to such factors as traffic or individual events like a honking horn. Because of the complexity of sound levels over the course of a day, and subjective human response, sound levels are generally described as a weighted average. Weighted averages place greater emphasis on nighttime and evening noise levels because people are usually at home and high noise levels are disruptive to activities such as sleeping. The Community Noise Equivalent Level (CNEL) and the Day and Night Average Level (L_dn) are the weighted noise averages most commonly used. The L_dn has been selected to evaluate noise in Fremont.

Impacts of Noise

The effects of noise on people can be grouped into three categories: subjective effects, interference with activities, and physiological effects. Subjective effects of noise are difficult to quantify. In a typical environment, about 10 percent of the population will object to any noise not of their own making regardless of the noise level. Subjective complaints increase when there is a large difference between the background noise and the noise source.

Interference can occur at a number of different noise levels depending upon the activity. Face to face conversation can occur with background noise levels of up to 66 dB(A), and group conversations with levels up to 50 or 60 dB(A). Sleep interference varies with the individual and the cycle of sleep. The California Office of Noise Control recommends individual events or isolated noises not exceed 50 dB(A) in bedrooms.

Physiological symptoms of noise levels above 70 dB(A) can include constriction of the blood vessels, changes in breathing and dilation of the pupils. Steady noises of 90 dB(A) have been shown to increase muscle tension and impair decision making. Long term exposure to noises above 70 dB(A) can cause hearing loss.

Noise Conditions in Fremont

Various sources throughout Fremont contribute to the overall noise environment. The most significant sources are transportation noise from vehicular traffic and railroads, industry, mechanical equipment and recreational activities. Other sources are less significant but may be important at a particular location.

Most major transportation routes (and especially those used by trucks) are significant sources of noise. In Fremont, major highways include I-880, I-680 and State Route 84. Major roads include Mission Blvd., Decoto Rd., Paseo Padre Parkway, Thornton Ave., Peralta Blvd., Central Ave., Blacow Rd., Mowry Ave., Walnut Ave., Stevenson Blvd., Grimmer, and Durham Rd. Noise measurements have been made on many of the roads between 1987 and 1989 (refer to Health and Safety Background Report for location and measurements). The highest noise levels occur along I-880 and I-680 at a distance of 100 feet from the center of the road. Mission Blvd. is the next highest generating an L_dn of 68-73 dB. Streets such as Stevenson, Mowry, and Fremont Blvd. generate an L_dn of 65-67 dB's at a distance of 100 feet from the center of the road. The existing L_dn has been calculated for each major street using a noise model (maps of existing noise contours can be found in the Noise Background Report to this General Plan).

Rail lines are another source of transportation related noise. Fremont has several rail lines crossing through the City as well as the BART rail-transit line. Noise measurements have been conducted at several locations along the lines. A train noise prediction model has been used to calculate the noise from railroads.

Industrial noise is another major noise source. Industrial noise sources are generally only significant in industrial areas. Other significant sources of noise include gas stations, car washes, fire stations, air conditioning units, mechanical equipment, child care centers and public schools. Although these sources do not usually produce sound levels as great as those from

industry, they are more frequently located near residential or other noise sensitive areas and are often sources of irritation and complaints.

The city has no commercial, military or general aviation airports. There is a temporary glider facility, but this presents no noise interference with residential development. One helistop is located in the Central Business District. Noise generated by helicopter activity is regulated by the use permit for this facility.

There are no heliport operations, jet engine test stands, or any other ground facilities and maintenance functions related to airport operation in Fremont.

Projections

Transportation will continue to be the most significant source of noise in the future. The continued growth of Fremont and surrounding areas will add to traffic on existing roads and highways. The projected increases in noise will not be significant on most secondary roads as traffic levels generally must increase by 100% for a noise levels to increase by 3 decibels. A change in 3 dB(A) or less is barely noticed by most people. The effects of increased commute traffic on major thoroughfares may be more significant due to volume and speed of the traffic. See Figure 10-10, for projected noise levels.

Construction of major roadways such as an extension of State Route 84 to Mission Blvd. or an I-680 to I-880 connector, and widening of existing Freeways such as I-880, may lead to a significant increase in noise levels. Noise mitigations such as soundwalls will be needed to maintain acceptable noise levels in sensitive areas.

New railroad passenger service has been proposed to link Fremont with the South Bay. The increased use of existing lines or the use of new lines will increase noise levels. Assuming that the new commuter train service is similar to the Peninsula Cal Train Service, the L_dn along the new commuter line would be in the range of 70 - 75 dB(A) at a distance of 100 feet from the tracks. Noise adjacent to the tracks could impact existing and future land uses. As proposals for this service are advanced, the City will evaluate the need for noise mitigation.

Industrial activity and noise will continue to increase as currently vacant industrial parcels are developed. This will have little affect in existing residential or more noise sensitive areas. Noise from industry may become more of a problem if currently designated industrial land is converted to residential or other noise sensitive uses.

There are no changes anticipated in air-traffic related noise.

Figure 10-10 2010 Projected Noise Exposure in Fremont

GOALS, OBJECTIVES, POLICIES AND IMPLEMENTATION

Health and Safety Goals

Protection of the health and safety of its citizens is one of the primary jobs of local government. A city's planning must take into account physical constraints and ensure that necessary safety services can be provided. Many risks cannot be eliminated. Residents of the Bay Area must all live with the virtual certainty of another major earthquake, and that fires, floods and other natural disasters will occur. The overall goal of local government is to minimize risks to residents and provide appropriate services and planning to address problems when they occur. The following goals, objectives, policies and implementation measures are the City of Fremont's response to some of the health and safety risks facing this City.

GOAL HS 1: Minimum feasible risk to the community from land instability and other non-seismically induced geologic hazards

GOAL HS 2: Minimum feasible risk to residents and property due to seismic activity

GOAL HS 3: Minimum feasible risk to residents and property due to flooding and flood induced hazards

GOAL HS 4: Minimum feasible risk to residents and property due to fire hazards

GOAL HS 5: A 5 minute 30 second response time for emergencies in areas below the toe of the hill

GOAL HS 6: Minimum feasible risk to lives and property due to the use and storage of hazardous materials and waste

GOAL HS 7: An emergency preparedness plan which provides effective response in the event of a natural or man-made disaster

GOAL HS 8: Noise at an acceptable level throughout the community

GEOLOGIC HAZARDS

HEALTH AND SAFETY (HS) GOAL 1:
Minimum feasible risk to the community from land instability and other non-seismically induced geologic hazards

OBJECTIVE HS 1.1: Development which responds to and minimizes geologic hazards

Policy HS 1.1.1: Control development in areas subject to geologic hazards and land instability.

Implementation 1: Continue to maintain Hill Area policies limiting the intensity and location of development in the geologically unstable Hill Area (see Land Use Chapter)

Implementation 2: Continue to prohibit development in unstable areas identified on Figure 10-1, Slope Instability Map, unless geologic investigation demonstrates hazards can be mitigated to an acceptable level. Require mitigation measures identified by the investigation to be incorporated into the conditions of approval for a project.

Policy HS 1.1.2: Require proposed new development in areas of potential geologic hazard identified on Figure 10-1, Figure 10-3, and Figure 10-5 of this General Plan to evaluate geologic hazards and sufficiently mitigate hazards through site planning, appropriate construction techniques, building design and engineering.

Implementation 1: Continue to require site-specific geo-technical studies for land development or construction in areas of potential land instability shown on Figure 10-1, Slope Instability Map of the General Plan. The studies should determine depth of bedrock, soil stability, and other localized geotechnical considerations. In areas designated as I2 on the Slope Instability Map, the study should also address soil stability in the vicinity of the development or construction site.

Implementation 2: Continue to require developers to include drainage, erosion and landslide mitigation measures, where necessary, to reduce landslide potential.

Implementation 3: Grading plans should minimize earth moving activity and site grading in areas of potential land instability, generally shown in Figure 10-1. The reduction, elimination or avoidance of identified geo-seismic hazards should be based on structural and non-structural techniques generally recognized by geo-technical consultants in the Bay Area to be applicable and feasible. Excessive grading to stabilize or reconstruct landforms should be discouraged.

HEALTH AND SAFETY (HS) GOAL 2:
Minimum feasible risk to residents and property due to seismic activity

OBJECTIVE HS 2.1: Development which responds to and minimizes the hazards related to expected seismic activity

Policy HS 2.1.1: Locate development to minimize potential damage resulting from seismic activity.

Implementation 1: Continue to comply with the provisions of the Alquist-Priolo Act and other seismic safety criteria established by the City of Fremont. Required geotechnical studies shall include a determination of the location of a fault (if on site), and an analysis of the site response to potential ground shaking. Continue to prohibit construction of structures for human occupancy (as defined by the State) within at least 50 feet of an identified fault trace as required by State law. In addition, the construction of attached garages within 50 feet of an identified fault trace is prohibited.

Implementation 2: Require site specific soils, geologic and/or geotechnical engineering studies prior to development approval of sites in areas identified with moderate to high (S4) or Severe Shaking Potential (S5) shown on Figure 10-3 of the General Plan, Groundshaking and Liquefaction Potential Map.

Implementation 3: Require site specific soils, geologic and/or geotechnical engineering studies prior to approving development on sites in areas identified as L3(w), L4 or L5 as shown on Figure 10-3 of the General Plan, Groundshaking and Liquefaction Potential Map.

Policy HS 2.1.2: Maintain construction and soil engineering standards which minimize earthquake danger to building occupants.

Implementation 1: Continue to require appropriate engineering and design mitigations for structures to minimize seismic hazards.

Implementation 2: Continue to require review and analysis of applicant-submitted geotechnical studies by a qualified consulting geotechnical engineer reporting to the City of Fremont. Projects must be built in conformance with the recommendations of the City's consulting engineer.

Policy HS 2.1.3: Locate critical facilities and systems vital to the public health and safety (e.g., water, power and waste disposal systems, police and fire stations, hospitals, and communication facilities) away from areas of greatest land instability, and design such facilities to mitigate any seismic or geologic hazards associated with the development site.

Implementation 1: Continue to require site specific geotechnical studies prior to construction of, or additions to, critical facilities when located within or near Alquist-Priolo Special Studies zones as shown on the Seismic Zones Map, Figure 10-4 of the General Plan.

Implementation 2: Continue to require new roads, bridges and utility lines crossing active fault traces be designed and developed in a manner to minimize damage from seismic or geologic hazards.

Implementation 3: Encourage special districts and private utility providers to retrofit existing utility lines which cross active faults with automatic shutoff devices or other means to accommodate possible surface rupture.

Policy HS 2.1.4: Continue to comply with State law related to rehabilitation or removal of unreinforced masonry structures susceptible to seismic hazards and damage.

Implementation 1: Prepare a study analyzing various alternatives for an effective program to mitigate hazards related to unreinforced masonry buildings. Based on this analysis, select and implement a program.

FLOODING

HEALTH AND SAFETY (HS) GOAL 3:
Minimum feasible risk to residents and property due to flooding and flood induced hazards

OBJECTIVE HS 3.1: Development locations and standards which limit the potential risks to health and safety and the risk of severe economic loss due to flooding and flood induced hazards

Policy HS 3.1.1: Continue to prohibit development of habitable (as defined by the Federal Emergency Management Agency) structures within the 100 year flood zone shown on Figure 10-6 of the General Plan, Inundation Hazards Map, unless the structures are designed to comply with existing National Flood Insurance Program criteria for construction.

Implementation 1: Enforce the City's existing flood control ordinances and regulations, amending them as necessary to conform with National Flood Insurance Program Criteria.

Implementation 2: Require flood resistant siting and/or construction as a condition of subdivision or development approval, in areas subject to minor flooding. When possible, limit amount of impervious coverage to reduce potential hazards of excessive run-off.

Implementation 3: Continue to refer all proposed projects adjacent to floodways and floodplains to the Alameda County Flood Control District for review and comments.

Implementation 4: Review CALTRANS projects for freeway improvements to ensure appropriate sized culverts and pipes are used, or existing inadequate facilities are replaced to accommodate 100 year flood requirements.

Policy HS 3.1.2: Maintain an evacuation plan in the event of inundation related to dam failure (see Emergency Preparedness Section for Implementation measures).

Policy HS 3.1.3: Ensure appropriate mitigations for increased risk due to possible failure of any major water storage facility.

Implementation 1: Evaluate risk and potential damage resulting from failure of any water storage facilities. Consider impacts on down-stream property owners and require appropriate mitigations

to minimize risks. Consider such risk in reviewing proposed subdivisions and site plans for potentially affected properties.

FIRE HAZARDS

HEALTH AND SAFETY (HS) GOAL 4:
Minimum feasible risk to residents and property due to fire hazards

OBJECTIVE HS 4.1: Development locations and standards which limit the potential health and safety risks, and the risks of severe economic loss due to fire hazards

Policy HS 4.1.1: Provide an adequate level of fire equipment and personnel to protect the community.

Implementation 1: Continue to implement plan for improving fire service through expansion to 11 stations, movement of stations and other improvements.

Implementation 2: Periodically review existing and projected land uses within the City in regard to the need for fire stations, staff and equipment.

Implementation 3: Continue to review multi-story high occupancy development to ensure compliance with the California Building Code and Fremont Fire Department standards for construction and adequacy of water flow for fire protection.

Implementation 4: Continue to require adequate fire flow (water quantity and duration) and hydrants as per City standards.

Implementation 5: Continue to encourage improvements where the required fire flow and minimum residual water pressure standards are not met.

Implementation 6: Consider designating areas not meeting the required fire flow or minimum residual water pressure standards as Hazardous Fire Areas.

Policy HS 4.1.2: Require adequate access and clearance for fire equipment, fire suppression personnel, and evacuation.

Implementation 1: Continue to review projects for necessary fire access and clearances.

Implementation 2: Continue to review industrial, commercial and institutional buildings more than 35 feet in height for adequacy of access and clearance, and require additional vehicular access or clearance areas as determined by the Fire Department.

Implementation 3: Continue to enforce existing regulations related to fire resistant construction, early warning fire detection system installation. Maintain accurate information on contents and processes used within structures and location and number of structures on a site.

Policy HS 4.1.3: Require fire mitigation measures in developments proposed outside a 5 minute 30 second response time area. Limit development in those areas where, despite fire mitigation measures, an acceptable level of protection is considered unattainable.

Implementation 1: Continue to review hillside subdivisions for adequate fire services and mitigation measures.

Implementation 2: Continue to require properties or processes with a potentially higher risk, or outside the five minute 30 second response area for fire protection services, to provide supplemental mitigation measures such as wetbands, fire resistant construction, sprinkler systems and early warning fire detection systems.

Implementation 3: Continue regulations and enforcement procedures to ensure maintenance of fire breaks in privately owned areas in the hills.

Policy HS 4.1.4: Promote fire safety and fire prevention in the community.

Implementation 1: Continue to provide fire safety demonstrations and presentations at public schools, civic and social organizations and other public gatherings.

Implementation 2: Continue to provide fire safety training at schools, industries and institutions.

Implementation 3: Continue to perform necessary analysis to focus fire prevention activities on current fire safety problems in Fremont.

HEALTH AND SAFETY (HS) GOAL 5:
A 5 minute 30 second response time for emergencies in areas below the toe of the hill

OBJECTIVE HS 5.1: Maximum feasible achievement of a five minute response time for areas where response time is identified as achievable

Policy 5.1.1: Continue to provide emergency response services throughout the City.

Policy 5.1.2: Consider improvements in services and facilities to provide maximum feasible achievement of a 5 minute 30 second response within the City.

Implementation 1: Periodically review the achievement of response-time goals, and identify possible improvements in service or facilities.

Policy 5.1.3: Continue to provide necessary training and equipment to improve emergency response.

Implementation 1: Continue to provide fire suppression and rescue service training.

Implementation 2: Periodically review training facilities to evaluate the need for expansion of existing facilities and the construction of new facilities.

HAZARDOUS MATERIALS

HEALTH AND SAFETY (HS) GOAL 6:
Minimum feasible risk to lives and property due to the use, storage and transportation of hazardous materials

OBJECTIVE HS 6.1: Sufficient regulation of land use to minimize potential health and safety risks associated with current or past use of hazardous materials in Fremont

Policy HS 6.1.1: Residential uses shall not be located in areas which could expose future residents to unacceptable health and safety risks.

Implementation 1: Assess risk related to hazardous materials when residential development is considered in proximity to an industrial area.

Policy HS 6.1.2 Ensure clean up of hazardous materials prior to a change in use from industrial to other uses.

Implementation 2: Continue to require an assessment of the past use of hazardous materials on proposed development sites where a change in use is proposed. Continue to require appropriate clean-up of contaminated sites prior to development.

Policy HS 6.1.3: Compliance with State law requiring adoption of a Hazardous Waste Management Plan.

Implementation 1: After State approval of the Alameda County Hazardous Waste Management Plan, adopt the plan by General Plan amendment, and revise the zoning ordinance as required.

OBJECTIVE HS 6.2: Sufficient regulation of the storage, transport and handling of hazardous materials within the City

Policy HS 6.2.1: Require that hazardous materials be managed in a manner that minimizes the risk to workers and residents.

Implementation 1: Enforce the provisions of the City's Hazardous Materials Ordinance.

Implementation 2: Continue to monitor and encourage the ban on transport of hazardous materials through Niles Canyon.

Implementation 3: Periodically review and evaluate the City's truck routes to ensure minimum possible risk to the community from the transport of hazardous materials on City streets.

OBJECTIVE HS 6.3: Sufficient emergency plans and response capability to respond to a hazardous material emergency

Implementation 1: Respond to hazardous materials related emergencies according to the guidelines in the Hazardous Materials Area Plan.

Implementation 2: Continue to promote appropriate training and preparation for a hazardous materials emergency within appropriate City departments.

EMERGENCY PREPAREDNESS

HEALTH AND SAFETY (HS) GOAL 7:
An emergency preparedness plan which provides effective response in the event of a natural or man-made disaster

OBJECTIVE HS 7.1: Efficient and effective City government operation in case of any catastrophic emergency or disaster

Policy HS 7.1.1: Maintain an Emergency Plan and adequately trained personnel to respond to man-made or natural disasters.

Implementation 1: Review and update Fremont's Emergency Plan.

Implementation 2: Continue to promote awareness and understanding of the City's Emergency Plan among City employees.

Implementation 3: Develop departmental emergency standard operating procedures (ESOP) to correspond to the assigned departmental tasks in the Fremont Emergency Plan.

Implementation 4: Continue to conduct emergency preparedness exercises for City staff to test the emergency service operations and train personnel in its use.

Policy HS 7.1.2: Promote public awareness of Fremont's Emergency Plan and encourage all citizens to take responsibility for their own safety in the event of a disaster.

Implementation 1: Continue to conduct seminars and make public presentations on emergency preparedness.

Policy HS 7.1.3: Coordinate Fremont's Emergency Plan with other local jurisdictions, utility districts and regional agencies to anticipate cumulative impacts during times of disaster.

Implementation 1: Review adjacent jurisdictions' plans and resolve areas of potential conflict.

HEALTH AND SAFETY (HS) GOAL 8:
An acceptable noise level throughout the community

OBJECTIVE HS 8.1: A noise environment which meets standards

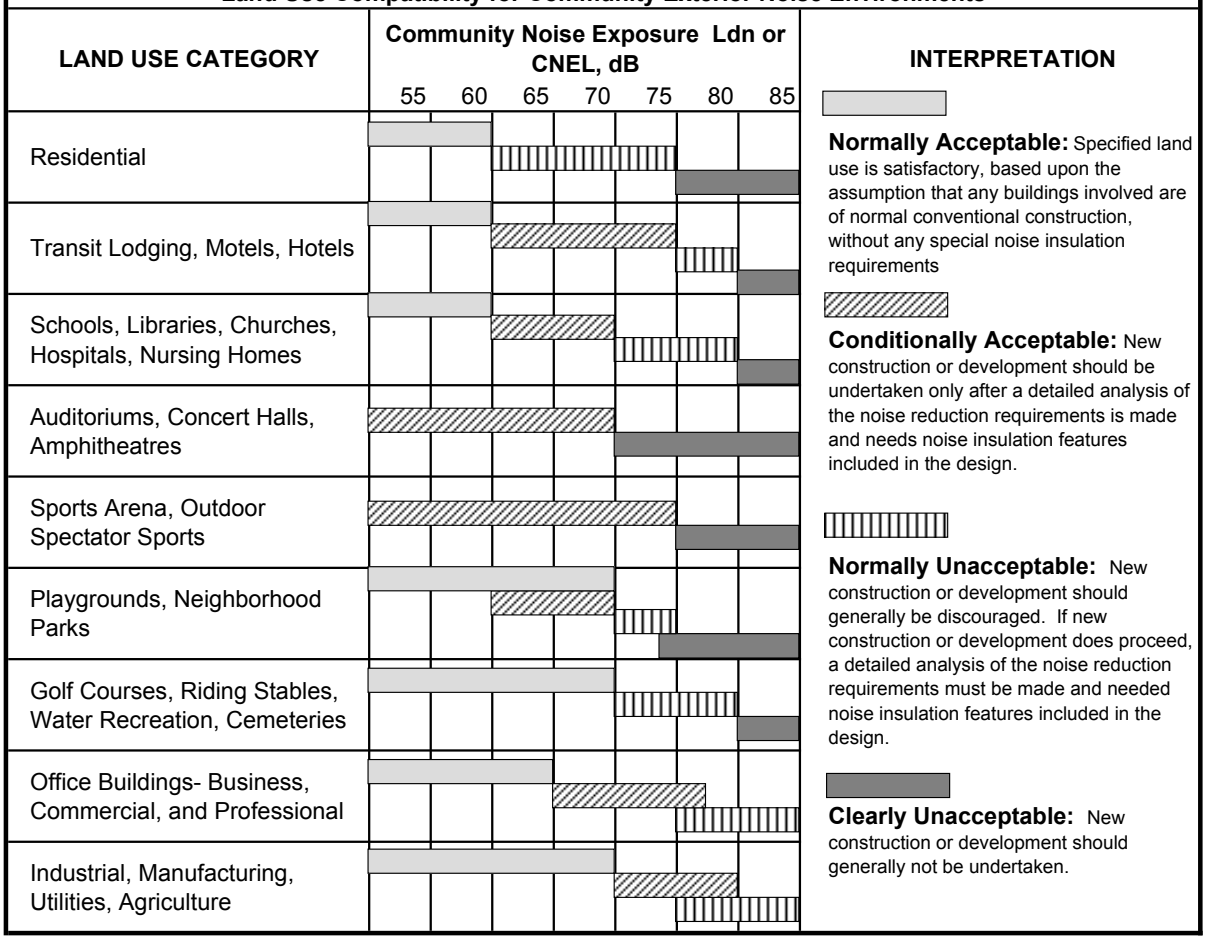
Policy HS 8.1.1: New residential development projects shall meet acceptable exterior noise level standards. The "normally acceptable" noise standards for new land uses established in Land Use Compatibility For Community Exterior Noise Environments shown in Figure 10-11 shall be used as modified by the following:

- The maximum acceptable noise levels in residential areas is an Ldn of 60 dB. This level shall guide the design and location of future development, and is a goal for the reduction of noise in existing development. A 60 Ldn goal will be applied where outdoor use is a major consideration (e.g., backyards in single family housing developments and recreation areas in multi-family housing projects). The outdoor standard will not normally be applied to small decks associated with apartments and condominiums, but these will be evaluated on a case by case basis. When the City determines that providing an outdoor Ldn of 60 dB or lower cannot be achieved after the application of feasible mitigations, an Ldn of 65 may be permitted at the discretion of the City Council.
- Indoor noise level shall not exceed an Ldn of 45 dB in new housing units.
- If the noise source is a railroad, then the outdoor noise exposure criterion can be 70 Ldn for future development, recognizing that train noise is characterized by relatively few loud events.
- Noise levels in new residential development exposed to an exterior Ldn of 60 Ldn) or greater should be limited to a maximum instantaneous noise level in bedrooms of 50 dB(A). Maximum instantaneous noise levels in other rooms should not exceed 55 dB(A).
- Appropriate interior noise levels in commercial, industrial, and office buildings are a function of the use of space and shall be evaluated on a case by case

basis. Interior noise levels in offices generally should be maintained at 45 Leq (hourly average) or less.

- These guidelines are not intended to be applied reciprocally. In other words, if an area currently is below the desired noise standards, an increase in noise up to the maximum should not necessarily be allowed. The impact of a proposed project on an existing land use should be evaluated in terms of potential for adverse community response based on a significant increase in existing noise levels, regardless of the compatibility guidelines.

Figure 10-11
Land Use Compatibility for Community Exterior Noise Environments



Implementation 1: Continue to use noise guidelines and contours to determine if additional noise studies are needed for a proposed new development. Prepare a format and guidelines for noise studies.

Implementation 2: New residential development shall not be allowed where the ambient noise level due to commercial or industrial noise sources will exceed the noise level standards as set forth in Figure 10-12, modified by the following as necessary:

- Each of the noise level standards specified in Table 10-2, Noise and Land Use Compatibility Standards for Industrial and Commercial Noise, shall be reduced by 5 dB(A) for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

Policy HS 8.1.2: Protect the noise environment in existing residential areas. In general, the City will require the evaluation of mitigation measures for projects under the following circumstances:

- The project would cause the Ldn to increase by 3 dB(A) or more,
- An increase would result in an Ldn greater than 60 dB(A)
- The Ldn already exceeds 60 dB(A).
- The project has the potential to generate significant adverse community response.

Policy HS 8.1.3 Noise created by commercial or industrial sources associated with new projects or developments shall be controlled so as not to exceed the noise level standards set forth in Table 10-2 as measured at any affected residential land use.

Table 10-2

Noise and Land Use Compatibility Standards for New Industrial and Commercial Noise Sources

Maximum Cumulative Duration of Noise Event	Exterior Noise Level Standards, dB(A)	
in Any One-Hour Period	Daytime - 7 AM – 10 PM	Nighttime - 10 PM – 7 AM
30 Minutes	50	45
15 Minutes	55	50
5 Minutes	60	55
1 Minute	65	60
0 Minutes	70	65

Policy HS 8.1.4: Control noise at its source to maintain existing noise levels, and in no case to exceed the acceptable noise levels as established in the Land Use Compatibility for Community Exterior Noise Environments (Figure 10-11).

Implementation 1: Consider adopting a noise ordinance to control noise generating activities such as horns, unmufflered engines, loudspeakers, etc.

Policy HS 8.1.5: Protect schools, hospitals, libraries, churches, convalescent homes, and other noise sensitive uses from noise levels exceeding those allowed in residential areas.

Implementation 1: Locate noise sensitive uses away from noise sources unless mitigation measures are included in development plans.

Policy HS 8.1.6: Design city streets to reduce noise levels in adjacent areas.

Implementation 1: Continue to require soundwalls, earth berms, set backs and other noise reduction techniques as conditions of development approval.

Policy HS 8.1.7: Encourage other agencies to reduce noise levels generated by roadways, railways, airports, and other facilities.

Implementation 1: Continue to work with the county Airport Land Use Commission (ALUC), State Office of Noise Control (ONC), and other agencies to reduce noise generated from sources outside of the City's jurisdiction.

Implementation 2: Work closely with Caltrans and other appropriate agencies to adequately quantify and mitigate the noise impacts associated with any extension of Route 84, the construction of an I-680 to I-880 connector, and the possible development of a railway commuter system or inter-city train service.