# 8 HEALTH AND SAFETY ELEMENT

State law requires a safety element to outline policies which will protect the community from both natural and human-induced disasters. This Health and Safety Element considers seismic, geologic, and soils hazards, fire hazards, flooding, hazardous materials release, waste management, magnetic fields, emergency management, and noise. Due to the City's relatively flat topography, its built-up character, and its location, slope failure, wildlands fires, and dam failure are not considered threats to Alameda.

The seismic safety policies in Section 8.1 incorporate lessons learned during the Loma Prieta earthquake of October 1989. Property damage in the City involved ground infrastructure, such as sewer lines, gas mains, storm drains, and water mains, and streets and sidewalks which buckled and cracked. Brick chimneys on older structures collapsed. Most to the damage occurred in the Marina Village, Southshore, and Harbor Bay Business Park areas.

Following the earthquake, an Alameda Hazard Mitigation Team (AHMT) composed of six City departments analyzed emergency response and prepared a list of recommendations designed to save lives, lessen injuries, and reduce damage during future earthquakes. The recommendations are listed as "work elements," and specify tasks in detail. While not adopted as a part of the General Plan, the *City of Alameda Annex to the State Hazard Mitigation Plan for the October 17, 1989, Loma Prieta Earthquake, California*, should be used as a planning reference document. Some of the measures proposed by the AHMT are also helpful when coping with disasters, such as fires, flooding, or hazardous materials release.

The City is preparing an updated Emergency Operations Plan, which is expected to be adopted as the guide for disaster planning in Alameda.

The Bay Area Regional Earthquake Preparedness Project, County Disaster Planning, and the State Office of Emergency Services can provide additional reference materials for interested citizens.

## 8.1 SEISMIC, GEOLOGIC, AND SOILS HAZARDS

The largest concern regarding geologic and soils hazards in Alameda centers on the primary and secondary effects of ground movement due to earthquakes. After the initial shaking, secondary seismic hazards associated with earthquakes include liquefaction, lateral spreading, cracking of the ground surface, sand boils, slope failure, tsunamis and seiches. The likelihood of occurrence of these secondary effects due to groundshaking (with the exception of tsunamis and seiches) in the region is high. Other hazards include erosion due to wind and wave motion, slope instability, and differential settlement.

**Guiding Policies: Seismic, Geologic, and Soils Hazards**

8.1.a A soils and geologic report will be submitted if required by the Director of Public Works prior to the issue of all grading and building permits and submission of final maps, in accordance with the Subdivision Ordinance, to evaluate the potential for lateral spreading, liquefaction, differential settlement, and other types of ground failures.

*Parts of Bay Farm Island, the Oakland Airport, and the NAS were subjected to liquefaction and sand boils during the Loma Prieta earthquake.*

8.1.b Require design of new buildings to resist the lateral effects and other potential forces of a large earthquake on any of the nearby faults, as required by the Uniform Building Code.

*The San Andreas, Hayward, Calaveras and San Gregorio faults are of primary concern in the evaluation of seismic activity that affects the San Francisco Bay Area and Alameda. Any of these four faults are capable of producing large, destructive earthquakes that could affect the entire region.*

8.1.c Require building design to incorporate recommendations contained in the soils and geologic report.

8.1.d Require all structures of three or more stories to be supported on pile foundations that penetrate Bay Mud deposits to firm, non-compressible materials, unless geotechnical findings indicate a more appropriate design.

8.1.e Design underground utilities to minimize the effect of differential ground displacements.

8.1.f Continue to provide for the identification and evaluation of existing structural hazards, and abate those hazards to acceptable levels of risk.

*The City has identified unreinforced masonry (URM) building hazards and will continue to refine abatement policies (such as retrofitting), based on the nature of the building, as well as its location, historic value, and value as a revenue producer to the City. Other types of vulnerable construction, such as tilt-up slab, "soft story" wood frame construction, and non-anchored wood frame construction, are numerous in Alameda and have not been identified. The prevalence of these types combined with the soil profiles in Alameda leaves a large unidentified threat.*

*Funding for preventive measures such as reinforcing URM buildings, or bracing and bolting structures to their foundations is not readily available through specific State or Federal sources. According to the State Office of Emergency Services (OES), limited funds may become available through FEMA's Hazard Mitigation Grant Program. With $15 to $20 million to distribute throughout a 10-county area, OES is prioritizing requests which exceed available funds by over $80 million. To encourage retrofitting, the City may choose to consider offering owners subsidies, tax incentives, or low- or zero-interest loans.*

**Implementing Policies: Geologic, Seismic, and Soils Hazards**

8.1.g Design building entrances, exits, and other vital features to accommodate expected settlement.

*Buildings should be sited so entrances, exits, and other vital structures continue to be accessible as settling occurs.*

8.1.h Require owners of shoreline properties to inspect, maintain, and repair the perimeter slopes according to City standards as settlement occurs due to the consolidation of underlying Bay Mud and wave erosion.

*Bay Mud (a silty clay rich in organic materials) and Merritt Sand (a loose, well-sorted fine-to-medium grained sand with silt) are the two base soils underlying Alameda. Development along the edges of the Main Island and on all of Bay Farm Island rests on fill overlying Bay Mud. Bay Mud is prone to consolidation, leading to surface settlement, and potentially increasing perimeter erosion.*

*Projects such as the proposed Ballena Isle Hotel could increase island erosion, and should be mitigated according to City specifications/standards.*

8.1.i Develop a comprehensive public information program, supervised by one department, that provides information on seismic hazards,

including structural and nonstructural hazards, and areas most susceptible to damage.

*Current (1990) public information programs are fragmented, and different types and depths of information are handled by different offices, such as the City Manager's Office and the Fire Department.*

*The Fire Department's emphasis is on teaching earthquake preparedness and citizen self-help. Homeowners are encouraged to perform cost-effective seismic upgrades to their homes, such as bolting house frames to the foundation, sheathing cripple walls, strapping water heaters to studs, inspecting and repairing masonry chimneys, and developing neighborhood-level preparedness.*

8.1.j Amend the local Uniform Building Code, as frequently as may be prudent, to incorporate standards for new and modified construction pertaining to development on areas of fill or underlain by Bay Mud or Merritt Sand.

8.1.k Conduct periodic earthquake and emergency fire drills; coordinate these drills on a regional basis in cooperation with involved jurisdictions and affected community organizations.

*This policy, from the 1976 Safety Element for Alameda, continues to have relevance and important public health and safety benefits. Multijurisdictional disaster planning is essential given the contiguous boundaries of cities within the Bay Area.*

8.1.l Continue to cooperate with the East Bay Regional Park District on beach erosion abatement.

*While tides and currents move sand from Crown Memorial State Beach, the joint efforts of the City and the East Bay Regional Park District serve to mitigate this erosion. To maintain the beach, sand is caught in offshore traps and returned to the beach. Vegetation helps anchor the sand.*

## 8.2 FIRE HAZARDS

Major fires are most likely to occur in large apartment complexes or industrial areas. Fires resulting from the rupture of local gas or electric lines during an earthquake could be severely compounded by water main failures.

**Guiding Policies: Fire Hazards**

8.2.a Maintain and expand the City's fire prevention and fire-fighting capability.

*The Fire Department is requesting a new fireboat which, when coupled with a recently ordered 5-inch hose, could provide a virtually unlimited supply of Bay water to much of the City, regardless of earthquake-induced damage to the EBMUD water main system.*

8.2.b Maintain the current level of emergency medical service.

**Implementing Policies: Fire Hazards**

8.2.c Update the City's list of "critical facilities."

*The 1976 Safety Element contained a listing of 49 "critical facilities" in Alameda, "whose presence and continued functioning constitutes a vital role in a potential emergency, or whose failure might prove catastrophic." These facilities included the hospital, fire and police stations, City Hall, schools, auditoriums, and ambulance services.*

8.2.d Assure the compliance of new structures with the City's current Fire, Seismic, and Sprinkler Codes. Existing structures shall be required to comply with the intent of the Codes in a cost-effective manner.

*Judgment and ingenuity are needed to balance safety concerns with economic realities so that Alameda can retain moderate-cost living and working space as well as important historic buildings.*

8.2.e Require new development to plan underground utilities so disruption by earthshaking or other natural disasters is diminished.

## 8.3 FLOODING

The 100-year flood (a flood having a one percent chance of occurrence in any year) generally has been accepted as the basis for flood hazard evaluation, flood insurance, and flood planning. Although the San Francisco Bay region is rarely subjected to area-wide floods, the potential for a 100-year flood in Alameda needs to be evaluated. Physical changes of land in Alameda include modification and additions of lagoons on Bay Farm Island, additional fill and new development on Bay Farm Island, and new development and land-use changes on the Northern Waterfront near the Posey Tube.

The Preliminary Flood Insurance Study, published in June 1990, but still awaiting adoption, delineates the boundaries of areas subject to 100- and 500-year floods. Preliminary flood insurance maps prepared by the Federal

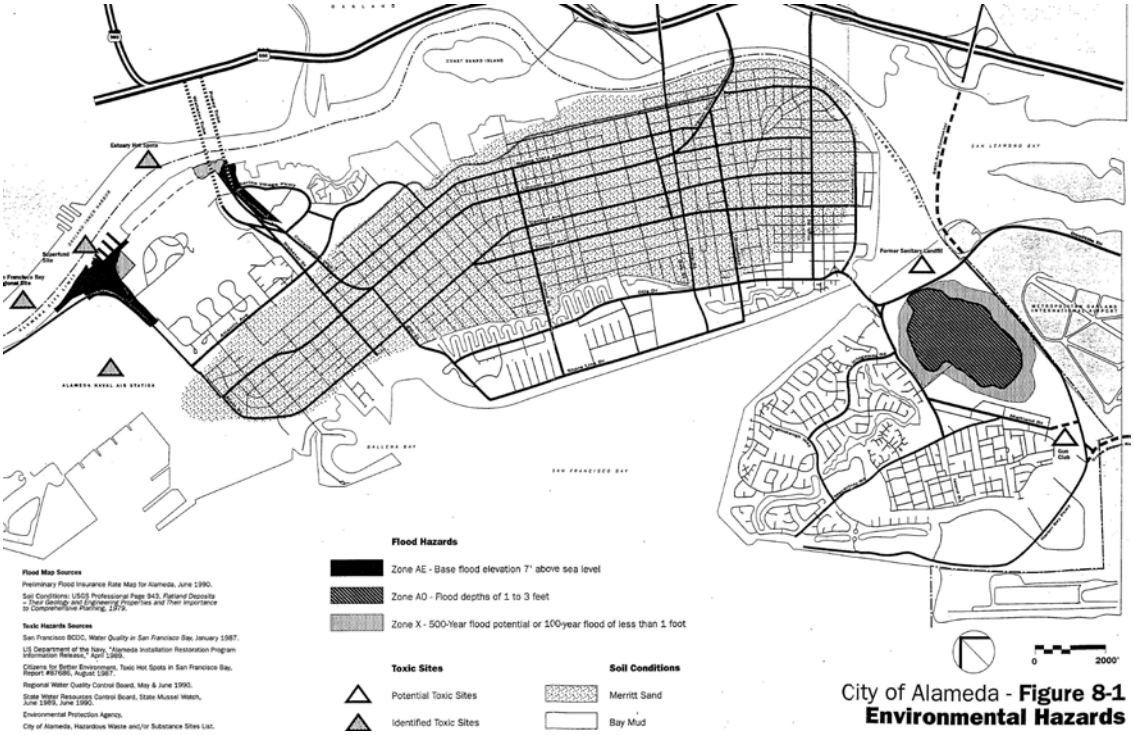
Emergency Management Agency are the source for flood areas shown on Figure 8-1, Environmental Hazards.

Global warming and accelerated sea rise could have severe long-term effects on Alameda. There is little the City can do to prevent sea level rise, although citizens acting individually may collectively make a difference. Plan policies encourage an awareness that will allow the City to design appropriate responses should the need arise.

**Guiding Policies: Flooding**

8.3.a Adopt the final version of the June 1990 Preliminary Flood Insurance Rate Maps produced by the Federal Emergency Management Agency for Alameda.

8.3.b Ensure that structures proposed for sites located on flood plains subject to the 100-year flood are provided adequate protection from floods.




City of Alameda - **Figure 8-1**
**Environmental Hazards**

*Portions of Alameda identified to be at risk include areas along Main Street near the Gateway and near the Webster Street/Posey tubes.*

8.3.c Monitor EPA reports on sea level rise in order to anticipate impacts if sea level rise accelerates; coordinate with BCDC to design an appropriate response.

*Accelerated rates of rise would require an aggressive response on a regional basis. Estimates for future rates of sea level rise vary widely, from 4.32 inches over the next 50 years to estimates of up to 10 feet over the next 100 years. A representative of the EPA notes that there is perhaps a 5 percent chance that sea level rise by 2100 would exceed 6 feet.*

8.3.d Support national and international efforts to protect the Earth's ozone layer, including policy to minimize or prevent the release of chlorofluorocarbons and similar gases.

*The City's efforts to prevent the release of gases which contribute to the "Greenhouse Effect" would make only a tiny difference. However, international concern over this issue may lead to stricter controls of these gases over the next two decades on national, State, and local levels.*

*Actions individuals can take to slow global warming include planting more trees (specified as a part of the Street Tree Management Program, described in Section 6.1), using alternative forms of transportation to help reduce $CO_2$ emissions caused by automobiles (described in Section 4.2, Transportation Systems Management, Section 4.3, Transit, Section 4.4, Pedestrian Routes, and Section 4.5, Bikeways), recycling newspapers, glass, metal, and paper (specified in Section 8.4), and reducing use of plastic, styrofoam cups, and packaging materials.*

8.3.e Support a multi-use concept of waterways, including, where appropriate, uses for flood control, open space, nature study, habitat, pedestrian circulation, and outdoor sports and recreation.

**Implementing Policies: Flooding**

8.3.f Use all possible means of reducing the potential for flood damage in Alameda. These may include the requirement of flood-proofing, flood forecast and warning or evacuation programs, and stringent groundwater management programs to prevent subsidence.

*Relocation of existing structures has been identified as another method of reducing flood damage, but is considered generally economically infeasible and socially unacceptable.*

8.3.g Require the maintenance of easements along those drainage ways necessary for adequate drainage of normal or increased surface runoff due to storms.

*The lagoons on Bay Farm Island and along Otis Drive, for example, provide drainage for runoff and should be maintained as easements that preclude further development and enable continued maintenance.*

8.3.h Require new drainage facilities to be designed to minimize the effects of settlement.

*Areas of the island underlain by Bay Mud are especially susceptible to settlement and disruption of drainage and other underground facilities, because of the soft, compressible nature of the Bay Mud.*

8.3.i Reduce the effects of surface runoff by the use of extensive landscaping, minimizing impervious surface and drainage easements.

*The Harbor Bay Isle Master Plan uses some of these methods to reduce the amount of surface water runoff, thereby reducing negative impacts on the groundwater and natural drainage cycles. See also the Water Quality section within Section 5.1.*

8.3.j Require shoreline owners to maintain perimeter dikes to applicable standards.

8.3.k Leave adequate setbacks along waterfront areas for the expansion of seawalls and levees.

8.3.l Regularly inspect and maintain seawalls around the City.

## 8.4 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

The careful management of hazardous materials and the reduction in generation and safe disposal of both hazardous and non-hazardous solid waste contribute to the maintenance of public health and safety. Although these issues are most effectively approached on a regional level, General Plan policies outline strategies for coping with the presence of hazardous materials in the City, and stress citizen participation in reduction of the waste stream through recycling.

### HAZARDOUS MATERIALS

Hazardous materials are stored and transported throughout Alameda. Specific sites of concentrated materials include Alameda Point (GPA 01-01) (nuclear materials and paint sludge) and the Alameda Hospital (biowaste). The residues of spent ammunition from the former gun range operations (at the Gun Club

site) are currently being evaluated by the Alameda County Environmental Health Office to determine whether this material can be contained on site under paving. Hazardous materials found in industrial areas, small businesses, and households include: flammable and combustible liquids, solvents, paint, plating or photographic solutions, acids, and pesticides. Waste oil, gases, and other hazardous liquids associated with vehicle and heavy machinery maintenance are also present. General Plan policies support existing methods of problem assessment and response, and call for a comprehensive plan in the case of a large-scale disaster. Section 5.1 specifies policies governing the clean-up of potential water-quality-threatening hazardous water sites.

## HAZARDOUS WASTE MANAGEMENT

Hazardous materials often end up as hazardous waste. The 1989 Alameda County Hazardous Waste Management Plan estimated that the City of Alameda generates slightly more than 6,000 tons of hazardous wastes per year, representing 6 percent of the total hazardous waste stream generated in Alameda County. The largest component of the local hazardous waste stream is waste oil, and the Alameda Naval Air Station was (GPA 01-01) the largest generator of hazardous wastes, producing around one third of the City's total hazardous waste, and more waste than all the small waste generators combined. Section 9.6 provides more discussion of the status of hazardous waste clean-up at Alameda Point. (GPA 01-01)

The projected stream of hazardous wastes can be reduced significantly through both recycling efforts and source reduction. There are three large waste oil recyclers in Alameda County All American Oil Co., Pleasanton, Evergreen Oil Inc., Newark, and Waste Oil Recovery Systems Inc., Oakland, and two recyclers specializing in commercial solvents (Baron-Blakeslee Inc., Neward, and Safety Kleen Inc., Oakland). The Plan supports the City's continuing participation in the Alameda County Hazardous Waste Management Plan program, and policies in Section 5.1 specify measures to protect water resources from contamination by toxic wastes.

## SOLID WASTE MANAGEMENT

As with most East Bay cities, Alameda's non-hazardous solid waste is collected primarily by the Oakland Scavenger Company and taken to the Davis Street Transfer Station in San Leandro. From there, the solid waste is transported to and deposited in the Altamont Road Landfill. (Text associated with NAS Alameda deleted pursuant to GPA 01-01)

Altamont Road Landfill is anticipated to reach capacity and close in the year 2016; however, the life of the landfill could be extended with implementation

of resource recovery programs. Alameda County's Solid Waste Management Plan, July 1987, encourages cities to implement resource recovery programs, including recycling, curbside pickup, and energy recovery (waste-to-energy) programs. The Alameda County recycling rate as of 1985 was estimated to be 10-12 percent, and the Solid Waste Management Authority has adopted a goal of recovering 75 percent of the waste stream by 2005.

The City Council recently selected Oakland Scavenger Company for a curbside recycling program. Residents would participate voluntarily, and would be able to dispose of newspapers, brown paper bags, food and beverage containers, white paper, computer paper, aluminum, glass, two-liter soda bottles, and plastic milk and water bottle containers. The program would also incorporate an educational component.

In addition to recycling, the Solid Waste Management Plan encourages implementation of small-scale waste-to-energy facilities. In the 1970s, the Alameda Bureau of Electricity (ABOE) explored the options surrounding construction and operation of a waste-to-energy facility. Since then, the ABOE developed other sources of electric power generation, and the waste-to-energy project is now inactive.

**Guiding Policies: Hazardous Materials and Waste Management**

8.4.a Continue to identify and assess the risks associated with various hazardous materials transported in Alameda.

8.4.b Clarify responsibilities for resolving incidents of hazardous materials release.

*Alameda County's Health Services is the legal lead agency for enforcing hazardous materials transport regulations, but the Alameda Fire Department has first-response responsibility, including cordoning off the area, identifying the substance, and preventing further harm.*

8.4.c Apply the Emergency Operations Plan, if necessary, in response to a hazardous materials release disaster.

*The Emergency Operations Plan outlines the primary and secondary functional responsibilities for each City department, in the case of an emergency or disaster.*

8.4.d Continue to support the resource recovery measures specified in the Alameda County Solid Waste Management Plan, July 1987.

*Resource recovery measures include recycling of aluminum, glass, newspapers, corrugated materials, and construction and demolition debris. The Solid Waste Management Plan additionally encourages the development of waste-to-energy facilities, composting practices, and the recovery and reuse of scrap iron, steel, and tin.*

8.4.e Continue to support implementation of the Alameda County Hazardous Waste Management Plan.

*The March 1989 Final Alameda County Hazardous Waste Management Plan was prepared by the Alameda County Hazardous Waste Management Authority to meet the requirements of AB 2948 (Tanner Bill). The goals of the Plan are to protect the public health, safety, welfare, and environment through eliminating land disposal of untreated hazardous waste, and to help business and households in Alameda County reduce hazardous waste production and manage their remaining waste effectively.*

**Implementing Policies: Hazardous Materials and Waste Management**

8.4.f Continue to rely on the mutual aid services of Alameda County (Text associated with NAS Alameda deleted pursuant GPA 01-01) to reduce the potential for hazardous materials accidents.

*See also policies 5.1.s, 5.1.t, and 5.1.u for policies on hazardous waste which might affect water quality(.GPA 01-01)*

8.4.g Improve the training and capability of the Fire Department to handle moderate-size releases of hazardous materials without dependence on outside aid.

8.4.h Continue to remove the methane gas produced as a waste product of materials decomposing in the former dump, Mt. Trashmore.

*This process is expected to be completed by the year 2000, and is required as part of the City's compliance with BAAQMD regulations. Methane, a colorless, odorless gas, is flammable.*

8.4.i Require those who store hazardous materials to have the training and capacity to respond to their own emergencies.

*In the event of a large-scale disaster, City personnel will prioritize emergency calls. Private and public agencies storing hazardous materials should be able to deal with containment and clean-up.*

8.4.j Implement the recently approved residential area curbside recycling program.

8.4.k Design and implement a recycling program for commercial and industrial businesses, including paper product recycling strategies for business parks.

8.4.l Adopt procedures that provide for adequate control measures for all buildings constructed on or near areas where surface emissions of hazardous soil gases may occur.

## 8.5 MAGNETIC FIELDS

Electric and magnetic fields abound in nature, and emanate from the flow of electricity through everything from transmission lines to household appliances. After several years of analysis of dozens of studies exploring a possible connection between cancer and extremely low frequency (ELF) electromagnetic fields, the EPA has concluded that a growing body of data suggests a causal link. Because the data suggests rather than proves a link, the EPA has not formally classified power-line electric magnetic fields as a potential carcinogen.

Congressional bills that would boost Federal funds for research into the biological effects of electromagnetic fields, including ELF fields from power lines in residential areas, are under consideration.

**Guiding Policy: Magnetic Fields**

8.5.a Support research on the health effects of magnetic fields generated by power transmission lines and other sources, and take appropriate action, if warranted, to reduce hazardous exposure.

*Magnetic fields are measurable, but their intensity is not related to any yet-established health standards, and ELF effects on human tissue are subtle, complex, and poorly understood. Cancer risk has been associated with long-term residence close to high-voltage power lines and substations. Department of Energy and PG&E studies are in progress during 1990.*

*The Alameda Bureau of Electricity monitors the popular press and industry-related news in an attempt to keep the citizenry informed.*

## 8.6 EMERGENCY MANAGEMENT

The Emergency Operations Management program in Alameda is intended to coordinate response to potential disasters such as hazardous materials spills or clouds, nuclear accidents, and hazards due to earthquakes, fire, or aircraft crash. Specific policies for each of these hazards are listed under Seismic Hazards, 8.1.; Fire, 8.2; Flooding, 8.3; and Hazardous Materials, 8.4. This section refers to the overall management and responsibility plan for controlling or reducing the consequences of any of these hazards if they are realized. The Emergency Operations Plan is still in its infancy; departmental annexes outlining responsibilities are being developed, with completed annexes available for fire and rescue, personnel, and management departments. Disaster exercises are planned and carried out on a periodic basis. Since the details of emergency management will be specified in the Emergency Operations Plan (EOP), Section 8.6 only highlights a few key aspects of emergency preparedness.

**Guiding Policy: Emergency Management**

8.6.a Adopt the recommendations and standards to be established in the City of Alameda's Emergency Operations Plan as the guide for disaster planning in Alameda.

**Implementing Policies: Emergency Management**

8.6.b Designate staff and assign time for the continued update and implementation of procedures outlined in the Emergency Operations Plan (EOP).

*The proximity of Alameda to two major earthquake faults, the large percentage of the City built on unstable soils, and potential isolation of the Main Island (outside aid would not be able to reach the Island by automobile if tubes and bridges failed) encourage the arrangement of staff time to complete emergency planning services.*

8.6.c Establish community programs to train volunteers to assist police, fire, and civil defense personnel during and after a major earthquake, fire, or flood.

*The City can encourage this training by publicizing courses available to the public in standard CPR and First Aid, as well as disaster-oriented training. The Emergency Operations Plan should specify locations to which volunteers can report during an emergency, and should include listings of appropriate jobs for volunteers. The City*

*Personnel Department and the Alameda Red Cross should coordinate their efforts.*

8.6.d Aim for City-level self-sufficiency in emergency response.

*While multijurisdictional planning is an ideal, in the event of a regionwide disaster the emergency services of the State, County, and Federal agencies, and of adjacent locales may be severely strained. Slippage on the San Andreas or Hayward faults, for example, may interrupt communication with outside emergency services or cut off evacuation routes, requiring the City to handle the crisis in isolation. The Emergency Operations Plan may include provision for City personnel training as emergency services workers and damage assessors. Mass care centers will be identified, as will strategies for staffing, supplies, and coordination among City departments.*

8.6.e Establish a priority system of evacuation routes.

*Alamedans are limited to several "exits" from the City during an evacuation. Emergency personnel are reluctant to designate evacuation routes until a disaster occurs, since the details of a particular emergency (location and extent) will aid in determining evacuation pathways. Primary routes are Dollittle Drive, Posey Tube, and Park Street Bridge.*

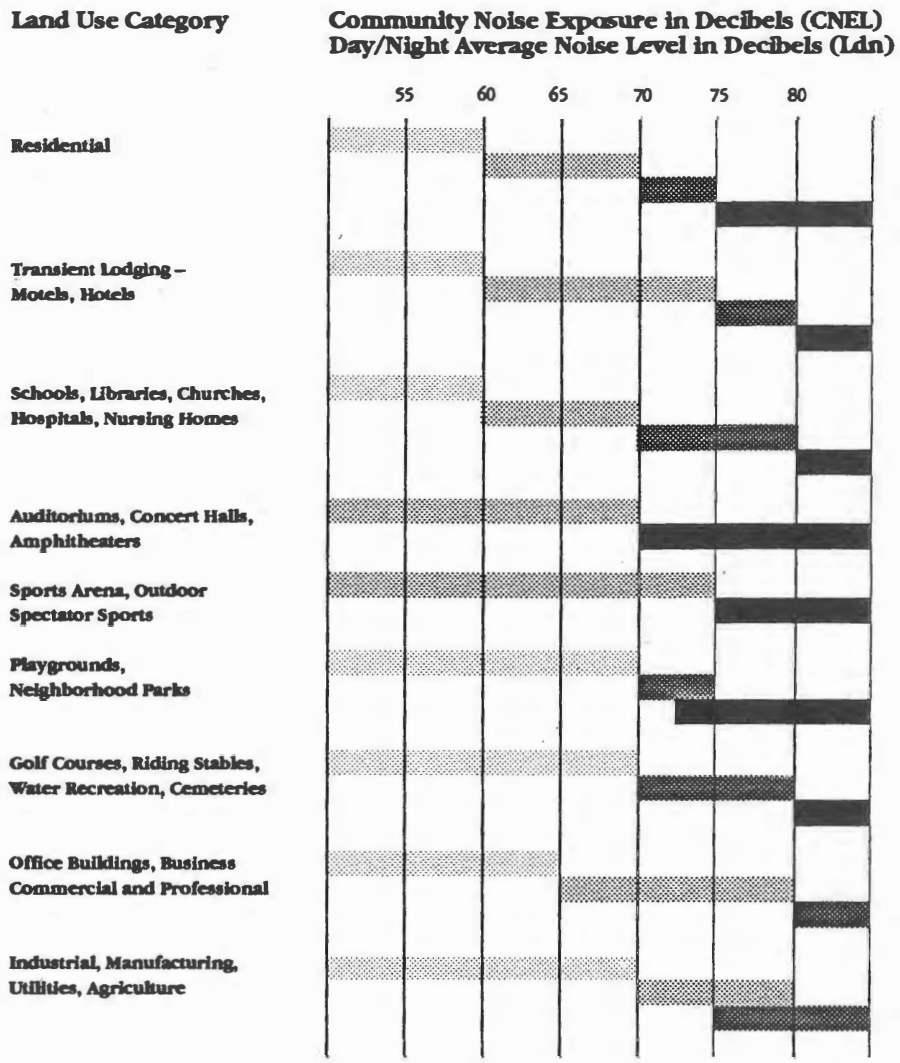
8.6.f Designate Crown Beach (parking lot), Rittler Park, Krusi Park, and the Municipal Golf Courses as emergency operations staging areas.

## 8.7 NOISE

Aircraft noise is Alameda's primary noise problem, followed by surface traffic noise. Section 7, Airport Environs Element, includes policies intended to limit airport noise and establish sound insulation requirements for noise-sensitive uses exposed to aircraft noise exceeding 65 dB CNEL. This section includes policies relating to all noise sources and establishes sound insulation performance standards. In recognition of the physiological and resulting economic effects of excessive noise, State law requires preparation of a Noise Element "which shall identify and appraise noise problems in the community." The California Department of Health Services publishes recommended Land Use Compatibility Standards for Community Noise Environments (Table 8-1) that are the basis for noise mitigation policies.

Table 8-1

## Land Use Compatibility Standards for Community Noise Environments




**NORMALLY ACCEPTABLE**
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

**CONDITIONALLY ACCEPTABLE**
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

**NORMALLY UNACCEPTABLE**
New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

**CLEARLY UNACCEPTABLE**
New construction or development clearly should not be undertaken.

Source: Modified from State of California General Plan Guidelines, June 1987.

Figure 8-2 illustrates street and railroad noise in 2010, based on projected traffic volumes, speeds, and percentage of trucks, and assuming constant railroad use. The Community Noise Equivalent Level (CNEL) is a 24-hour energy equivalent expressed in decibels (dB), and is derived from a variety of single-noise events. To account for increased sensitivity to noise during the nighttime hours, the CNEL calculation penalizes evening and nighttime sound levels. The decibel (dB) scale is logarithmic; a 3 dB difference is barely discernible to most people, and a 10 dB increase is subjectively heard as a doubling of noise.

The CNELs on the map were prepared using a mathematical model of traffic noise that projects "worst case" conditions. It indicates where site-specific studies are needed to determine whether noise compatibility exists or how it might be achieved. To calibrate the model, 24-hour measurements were made in 1989 at typical building setback lines at six locations. Projected noise levels at buildout on Figure 8-2 are at 40 feet from street centerlines.

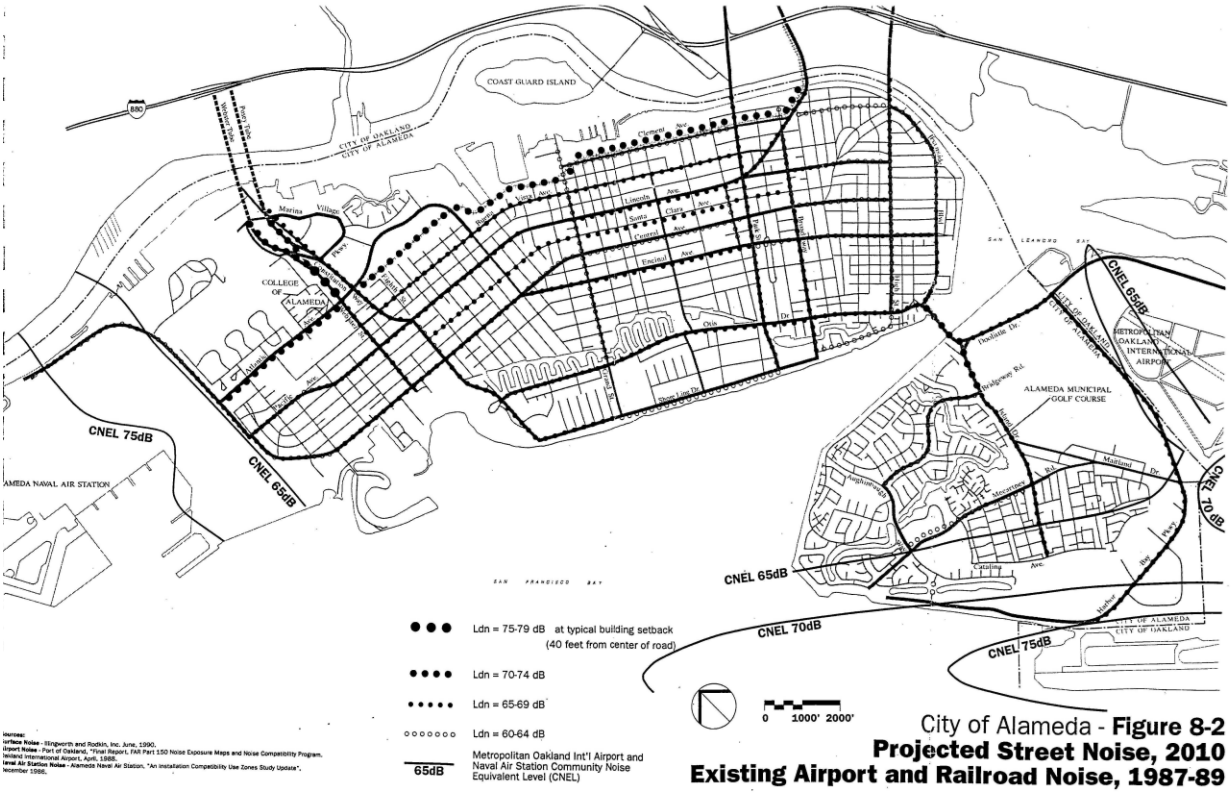
A table of distances from the centerline to contours of 60 dB and above, in 5 dB increments, appears in Appendix 6, Projected (General Plan Buildout) Traffic Noise Contour Distance, City of Alameda. These contours assume no shielding by buildings. Because Alameda is densely built with narrow side yards, noise levels in the rear yards of houses and apartments typically are 10 dB lower than at the building facade. Thus, virtually all rear yards and homes on streets for which no noise level is indicated on Figure 8-2 are expected to be consistent with State guidelines. The major street noise problem is impact on the indoor environment in buildings facing streets exceeding 60 dB CNEL at 40 feet from the centerline.

With the exception of Harbor Bay Parkway, noise exposure along Alameda streets will not change significantly between 1989 and buildout. Increases will be 3 dB or less, a change that hardly will be noticed as it take place will over a period of years. Along Harbor Bay Parkway, increases of 7 to 8 decibels will not affect residential areas. Offices less than 150 feet from the Parkway centerline will be in the 65-70 dB range considered conditionally acceptable.

Railroad noise caused by delivery of one Southern Pacific train of one to 50 cars to the Alameda Beltline railyard between midnight and 6 a.m., Tuesday through Saturday, is expected to remain constant. Single event noise generated by the switching engine is 90 dBA, and the trains are required by law to sound their whistles at each of six grade crossings, emitting 100-105 dBA at 100 feet.

During 1989-90 the City has received general noise complaints (unrelated to aircraft) at a rate of one a month. Business/industrial operations, such as small machinery and night truck deliveries, accounted for most of the nuisances. The 1976 Noise Element noted shipping, shipyard, and other major industrial noise sources, some of them in Oakland, as problems. Several have ceased operation, and none was the subject of recent complaints to the City of Alameda.

Chapter 5 of the Municipal Code, the Community Noise Ordinance, 2177 N.S. (1984) establishes exterior noise standards, requires submission of noise reduction plans for noncomplying sources, and requires implementation of noise-reducing actions determined by Planning Board to be cost effective.




City of Alameda - **Figure 8-2**
**Projected Street Noise, 2010**
**Existing Airport and Railroad Noise, 1987-89**

Daytime noise associated with construction or with maintenance of residential property is exempt.

**Guiding Policies: Noise**

8.7.a Minimize vehicular and stationary noise sources, and noise emanating from temporary activities.

8.7.b Require site and building design to achieve noise compatibility to the extent feasible.

8.7.c Recognize that residential, school, hospital, church, or public library properties in commercial areas and commercial development in industrial areas will be subject to noise levels associated with noisier permitted uses.

*Chapter 5 of the Municipal Code, Community Noise, sets noise level standards for receiving land uses and requires noise sources to submit a noise reduction plan where the standards are violated.*

8.7.d Maintain efforts to mitigate impacts of aircraft noise while pursuing actions to reduce aircraft noise or avoid noise increases.

*Section 7, Airport Environs Element, includes policies relating to Metropolitan Oakland International Airport (MOIA) expansion, operating policies, and aircraft noise emissions.*

**Implementing Policies: Noise**

8.7.e Require acoustical analysis for new or replacement dwellings, hotels, motels, and schools within the projected 60 dB contour. Single-family dwellings not constructed as part of a subdivision requiring a final map require acoustical analysis only within the projected 65 dB contour.

*See Title X Buildings, Chapter 10, Noise Insulation Standards, of the Alameda Municipal Code for additional detail.*

8.7.f Require new or replacement dwellings, hotels, motels, and schools within the noise impact areas described in Policy 8.7.e, above, to limit intruding noise to 45 dB CNEL in all habitable rooms. In new dwellings subject to a noise easement, noise is not to exceed 40 dB CNEL in habitable rooms. If this requirement is met by inoperable or closed windows, a mechanical ventilation system meeting Uniform Building Code requirements must be provided.

*An average house with no special noise control provisions reduces noise by 15 to 20 dBA with the windows partially open. Sealed windows, weatherstripping, and solid core doors can add 15 dBA reduction. Therefore, 45 dB interior CNEL can be achieved at up to 75 dB exterior CNEL. However, the single events, such as aircraft flyovers, will require greater reductions at some locations to comply with Policy 8.7.f.*

8.7.g Minimize the impact of aircraft, railroad, and truck noise by requiring that noise levels caused by single events be controlled to 50 dB in bedrooms and 55 dB in living areas within the 60 dB contour.

8.7.h In making a determination of impact under the California Environmental Quality Act (CEQA), consider the following impacts to be "significant":

- An increase in noise exposure of 4 or more dB if the resulting noise level would exceed that described as normally acceptable for the affected land use, as indicated in Table 8-1.
- Any increase of 6 dB or more, due to the potential for adverse community response.

8.7.i Continue to enforce the Community Noise Ordinance.

8.7.j Enforce compliance with noise emissions standards for all types of automotive vehicles established by the California Vehicle Code and by Federal regulations.

8.7.k Urge AC Transit to use small buses for routes on minor streets as a noise-reduction measure.

8.7.l Maintain day and nighttime truck routes that minimize the number of residents exposed to truck noise.

8.7.m With the cooperation of the U.S. Coast Guard and the City of Oakland, enforce California noise emission standards for engine-driven vessels.

8.7.n Enlist the cooperation of the Alameda Beltline Railroad operators to attain the following objectives:

- Compliance with Federal standards for rolling stock.
- Maintenance of roadbed, rail joints, switches, etc., to avoid excessive wheel-to-rail-to-roadbed noises and vibrations.
- Minimal use of acoustical signals that can be heard over an unnecessarily large area.