Chapter Three – Hazard Prevention

INTRODUCTION

The Hazard Prevention Chapter of the Sierra Madre General Plan contains four components: fire safety, flood/landslide, seismic safety (all part of the State-mandated safety element) and noise (State-mandated noise element.)

Sustainable policies and goals are called out by a green leaf icon.

Section One: Fire Safety

OVERVIEW OF EXISTING CONDITIONS

Fire protection in Sierra Madre is provided by the Sierra Madre Fire Department. The Fire Department is made up of career, paid part-time, and volunteer firefighters. The fire station is located at 242 W. Sierra Madre Blvd., next to City Hall. The Fire Department staff consists of volunteers, part-time paramedics, a part-time administrative assistant and a full-time staff that includes captains and the Fire Chief. The daily manning of the Department consists of part-time paramedics, shift firefighters, an engineer, a duty captain and a battalion chief. The Fire Chief is responsible for the administration of the department. Each captain administers a division of the department to include Fire Prevention, Training, and Emergency Medical Services, provides for the daily supervision of a duty crew. Captain/Fire Marshal is responsible for fire prevention and the hiring, training and supervision of the engineers. Captain/Paramedic Coordinator is responsible for Emergency Medical Services and the hiring, training and supervision of parttime paramedics. The Captain/Training Officer is responsible for training/certification programs and the hiring, training and supervision of shift firefighters.

Since 1996, the average number of calls for fire and medical emergencies has increased from 700 to 850 annually. The response time for an emergency is 4-5 minutes from the time the call is received at the regional Dispatch Center. All calls are received at the Police Department Dispatch that then transfers the call to the Verdugo Fire Communication Center for appropriate action. In addition to Station Alerting, members of the Fire Department are equipped with pagers for notification of an emergency.

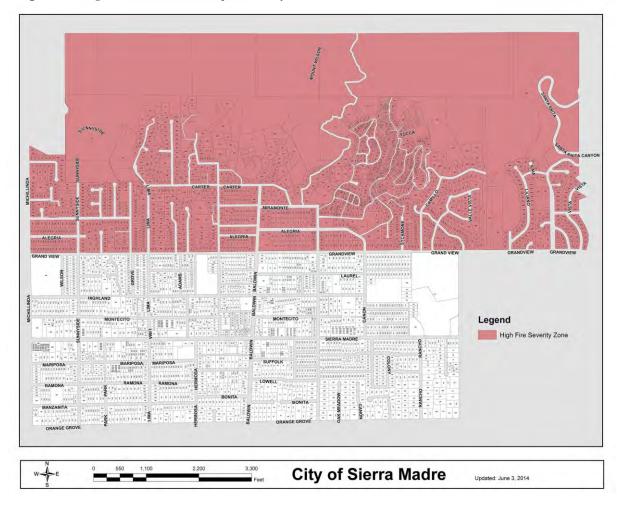
The Fire Department participates in the State Master Mutual Aid Agreement and has a mutual aid agreement with the cities within Area C, a group of local communities from Burbank to Monrovia and as far south as Monterey Park. In addition, Sierra Madre provides first response services for Los Angeles County Fire Department and the U.S. Fireorest Service in the hillside brush areas immediately north of Sierra Madre City limits.

The closest hospitals and medical facilities outside of the high fire risk areas include the Sierra Madre Medical Center, Arcadia Methodist Hospital, and Huntington Memorial Hospital in Pasadena. In the event that emergency shelters are needed, the Hart Park House Senior Center can be used in conjunction with the Sierra Madre Congregational Church.

High Fire Severity Zone

While Sierra Madre's location at the base (southern foothills) of the San Gabriel Mountains affords the City with stunning views and other natural amenities, it also presents a significant wildfire hazard to people and structures. The natural, undeveloped slopes of the hillside areas within the City support open coastal sage scrub and chaparral habitats that are susceptible to wildfires to the San Gabriel Mountains. common Additionally, development in the canyon areas is characterized by narrow roads with tree canopy coverage. These tree canopies provide opportunities for hillside wildfires to spread, creating a potential fire hazard for residents of Sierra Madre. According to the Fire Hazard Severity Zone Map in Figure 3-1, areas of the City above Grand View Avenue are located in the High Fire Severity Zone, which is the highest possible designation according to the Los Angeles County Fire Department.

Figure 3-1 High Fire Hazard Severity Zone Map



Large fires have been part of southern California for many years. In April and May 2008, a fire raged through the foothills above Sierra Madre, forcing the evacuation of all the residents who lived on Grand View Avenue north to the foothills. This fire resulted in over 500 acres being burned, but no houses were destroyed. Table 3-1 outlines the large historic fires in southern California in order of structures damaged.

Table 3-1 Large Historic Fires in California 1923-2009

	Fire Name	Date	County	Acres	Structures	Deaths
1	Tunnel	October 1991	Alameda	1,600	2,900	25
2	Cedar	October 2003	San Diego	273,246	2,820	15
3	Witch	October 2007	San Diego	197,990	1,650	2
4	Old	October 2003	San Bernardino	91,281	1,003	6
5	Jones	October 1999	Shasta	26,200	954	1
6	Paint	June 1990	Santa Barbara	4,900	641	1
7	Fountain	August 1992	Shasta	63,960	636	0
8	Berkeley	September 1923	Alameda	131	584	0
9	Bel Air	November 1961	Los Angeles	6,090	484	0
10	Laguna Fire	October 1993	Orange	14,439	441	0
11	Paradise	October 2003	San Diego	56,700	415	2
12	Laguna	September 1970	San Diego	175,425	382	.5
13	Panorama	November 1980	San Bernardino	23,600	325	4
14	Topanga	November 1993	Los Angeles	18,000	323	3
15	49er	September 1988	Nevada	33,700	312	0
16	Símí	October 2003	Ventura	108,204	300	0
17	Sycamore	July 1977	Santa Barbara	805	234	0
18	Canyon	September 1999	Shasta	2,280	230	0
19	Kanan	October 1978	Los Angeles	25,385	224	0
20	Kinneloa	October 1993	Los Angeles	5,485	196	1
21	Grand Prix	October 2003	San Bernardino	59,448	196	0
22	Old Gulch	August 1992	Calaveras	17,386	170	0
23	Station Fire	August 2009	Los Angeles	144,743	91	2
24	Clampitt	September 1970	Los Angeles	105,212	86	4
25	Basin Complex	June 2008	Monterey	162,818	58	0
26	Stanislaus Complex	August 1987	Tuolumne	145,980	28	1
27	Campbell Complex	August 1990	Tehama	125,892	27	0
28	Wheeler	July 1985	Ventura	118,000	26	0
29	McNally	July 2002	Tulare	150,696	17	0
30	Hwy 58	August 1996	San Luis Obispo	106,668	13	0
31	Day Fire	September 2006	Ventura	162,702	11	0
32	Iron Alps Complex	June 2008	Trinity	105,805	2	10
33	Zaca	July 2007	Santa Barbara	240,207	1	0
34	Bar Complex	July 2006	Trinity	100,414	0	0
35	Big Bear Complex	August 1999	Trinity	140,948	0	0
36	Marble Cone	July 1977	Monterey	177,866	0	0
37	Matilija	September 1932	Ventura	220,000	0	0

Source: City of Sierra Madre 2008 Natural Hazard Mitigation Plan; California Department of Forestry and Fire Protection (CalFire), September 2009.

SUMMARY OF FIRE SAFETY GOALS

- 1. A high level of fire safety for the citizenry.
- 2. Proactive and preventative fire protection for existing and new development.
- 3. Continued participation in mutual aid with cities throughout California.

OBJECTIVES AND POLICIES

The City has established the following objectives and policies for fire safety in Sierra Madre. The implementation measures are contained in the Implementation Chapter at the end of the General Plan.

Objective Hz1: Adequate service levels of fire protection that meets the needs of Sierra Madre residents, businesses and visitors.

- Hz1.1 Maintain a combination volunteer and paid fighting force.
- Hz1.2 Promote public education about fire safety at home, in the community, and in the work place.
- Hz1.3 Continue to coordinate the provision of fire services with all public safety service providers and monitor their adequacy and responsiveness to community needs.
- Hz1.4 Encourage, facilitate, and participate in, where appropriate, the establishment of methods of communication between the Fire Department and Sierra Madre community members to discuss and resolve issues of responsiveness and sensitivity.

Objective Hz2: Adequate fire protection necessary for existing and future development.

- Hz2.1 Continue to require all existing and new development to install and maintain adequate smoke detection systems.
- Hz2.2 Continue to require all new development to install automatic fire sprinkler systems.
- Hz2.3 Continue to require review of building plans by a Fire Captain.
- Hz2. 4 Consider water availability in terms of quantity and water pressure for safety purposes when considering the size and location of new residential construction.
- Hz2.5 Assess the impacts of incremental increases in development density and related traffic congestion on fire hazards and emergency response time, and ensure through the development review process that new development will not result in a reduction of fire protection services below acceptable levels.
- Hz2.6 Continue to require new development to provide adequate hydrants and <u>require</u> that reservoirs are available to accommodate the fire protection needs of new construction.
- Hz2. 7 Protect the wild land/urban interface by considering fire hazards when evaluating projects in the from fire damage by limiting further development in canyon areas.
- Hz2. 8 Develop vegetation management plans that manage chemise and chaparral to ensure adequate firebreaks, to provide adequate access for fire

protection water systems, and access for firefighting.

Hz2. 9 Maintain and update hillside development standards which include fire prevention design measures.

Hz2.10 Work with Public Works, the Police Department and residents to develop a solution to parking issues that affect Fire Department access in the canyon areas.

Objective Hz3: Continued participation in mutual aid throughout California.

Policies:

Hz3.1 Continue to cooperate with Area C Fire Departments for second and third alarm calls and continue with the State-wide Mutual Aid Agreements.

Hz3.2 Work with Public Works staff of adjacent jurisdictions to ensure that roadways are adequate for fire equipment.

Objective Hz4: Emergency operations and disaster preparedness as a priority.

Policies:

Hz4.1 Update the Emergency Operations Plan annually.

Hz4.2 Maintain a fully operational Emergency Operations Center.

Hz4.3 Enlist participation from the community and City staff for emergency operations.

- Hz4.4 Provide emergency operations training and conduct test runs.
- Hz4.5 Review and upgrade emergency operations equipment such as 911 equipment, and the police dispatch system as needed to maintain modern levels of service.
- Hz4.6 Develop and utilize emergency public communication systems.

Objective Hz5: Limiting fire hazard through brush and weed abatement.

- Hz5.1 Mandate annual brush removal from April to June.
- Hz5.2 Work with community groups in presenting information and trainings regarding wildfire prevention and awareness.
- Hz5. 3 Promote voluntary efforts in tree trimming, and brush and weed abatement.
- Hz5.4 Identify funds by way of a tree assessment district or "environment fund" or other source of funds to pay for vegetation trimming and removal of dead wood on public property and private properties where vegetation is creating a canopy over public rights-of-way.

Section Two: Flood/Landslide

OVERVIEW OF EXISTING CONDITIONS

Flooding

Flooding represents a potential hazard to population and buildings, and as such, it is a component of the State-mandated safety element. This section addresses the risks of flooding due to the City's natural <u>terrain</u>, <u>vegetation physiography</u>, rainfall, <u>and</u> runoff, and risks associated with flooding due to dam failure.

Flood Insurance Rate Maps (FIRM) are published by the Federal Emergency Management Agency (FEMA.) As part of the National Flood Insurance program, the maps delineate areas of special flood hazard. The 2008 FIRM for Sierra Madre designates the overwhelming majority of the City as Flood Zone X, defined as "Areas determined to be outside the 0.2% annual chance floodplain." A small segment of the community, centered along the Little Santa Anita Creek channel, is classified as Zone D, an "Area in which flood hazards are undetermined, but possible."

However, there are specific areas unmapped by FEMA within the City that are considered to be at special risk for flooding. All of these areas are against the foothills and are of significant risk of flooding and landslides, particularly after a brush fire. The canyon urban/wild land interface areas above the City are the most prone to major flooding. In the years immediately following a brush fire in the foothills, these areas can be an extreme hazard to persons and property during heavy rainfall events. Flood in these special risk areas can occur rapidly or slowly depending on the time transpired since the fire, the frequency of rainfall events, the duration of rainfall events, and the intensity of the precipitation. Special flood hazard areas located in the residential portion of the City are subject to minor flooding.

Flood hazards associated with stormwater runoff channeled from the mouths of canyons in the northern part of the City have generally been controlled by dams, debris basins, and flood control channels. There is one dam and a total of seven debris basins located within the City. Table 3-2 below lists the existing debris structures and dam in a west to east order.

Table 3-2								
Facility Name	Owned/Operated	Туре	Capacity					
Sunnyside Debris Basin	LA County Public Works	Earth	Fill .64 DDE					
Bailey Canyon Debris Basin	LA County Public Works	Earth	Fill 1.60 DDE					
Floral Debris Basin	Sierra Madre Public Works	Earth	Not available.					
Auburn Debris Basin	LA County Public Works	Earth	Fill 1.12 DDE					
Carter Debris Basin	LA County Public Works	Earth	Fill 1.06 DDE					
Sierra Madre Dam	LA County Public Works	Concrete	Arch Dam 0.53 DDE					
Sturtevant Debris Basin	LA County Public Works	Earth	Fill 0.85 DDE					
Lannan Debris Basin	LA County Public Works	Earth	Fill 1.00 DDE					

The acronym DDE in Table 3-2 indicates Design Debris Event, a term that Los Angeles County Department of Public Works uses to describe the maximum amount of debris a burned watershed could produce. As noted in Table 3-2, the Sunnyside, Floral, Sierra Madre Dam, and Sturtevant facilities do not have capacity to contain the amount of debris that their watersheds could produce. Therefore, residential areas below these facilities are potentially subject to post-fire debris flow damage.

While these debris facilities protect most of the large watersheds above Sierra Madre, some watershed areas remain in an unprotected condition. If burned in wildfires, these watersheds will produce debris during rainfall events that will flow unhindered into the community. The most notable of these is Stonehouse Canyon, a 67-acre watershed capable of producing over 20,000 cubic yards of debris. The watershed outlets onto Stonehouse Drive above its intersection with Grandview Avenue. Other uncontrolled watersheds that have been identified are listed in Table 3-3, again, west to east:

Table 3-3

Watershed Location Area Discharges

Unnamed canyon above Mater Dolorosa behind Retreat Center Main Building: 9 acres Mater Dolorosa private property

Hillside above the private extension of Auburn Avenue northeasterly of the north end of the private street: 6 Acres Private and public portions of Auburn Avenue Unnamed canyon Parallel to and northwesterly from the private street section of Mt. Wilson Trail: 17 Acres across private property into Mt. Wilson Trail at East Mira Monte Avenue

Hillside above Skyland Drive northwesterly of 801 Skyland Drive: 19 Acres across private property into Skyland Drive Unnamed Canyon

Above Woodland Drive southwesterly of Sierra Madre Dam: 16 Acres across private property into the upper intersection of Woodland and Brookside Yucca Canyon* East end of Yucca Trail: 18 Acres Woodland Drive via Yucca Trail

* Los Angeles County Public Works has constructed debris structures in Yucca Canyon.

Flooding which occurs as a result of the structural failure of a dam is called dam inundation. Structural failure may be caused by seismic activity. Seismic activity may also cause dam inundation by the action of a seismically induced wave that overtops the dam without also causing dam failure. This action is referred to as a seiche. Landslides flowing into a reservoir are also a source of potential dam failure from overtopping.

The major dam which could have a significant impact on the City in the event of dam failure is the Little Santa Anita Dam/Sierra Madre Dam. However, failure of this dam during a catastrophic event, such as a severe earthquake, is considered a very unlikely event. Due to the method of construction of this dam, it has performed well in earthquakes, and failure is not expected to occur.

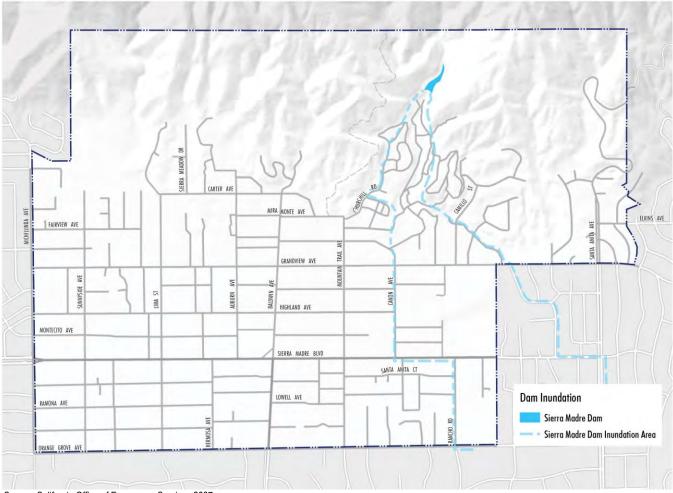
The area one quarter of a mile west of Santa Anita Canyon is an area requiring flood control. According to the Los Angeles County Public Works Department, the City is included in Big Santa Anita Dam's inundation area. However, even though the dam is located 2 miles northeast of the City, the dam is not considered to be a threat to the City in the event of dam failure. The Sierra Madre Dam operates as a "dry" dam and contains water only during rain as a flood control device.

Landslides

Severe flooding can also undermine the integrity of the soils in the hillsides and cause landslides. Landslides represent only one step in the continuous natural erosion process, and represent a basic geologic hazard. Ground shaking from an earthquake could provide the stimulus to initiate downslope movement of an already unstable earth mass. Movement could also be triggered by heavy rains or by grading. The landslide areas in the City occur at elevations between 1,400 and 2,000 feet, thus above the urban areas.

Mudflows, also known as debris flows, are a type of landslide experienced in Sierra Madre. Mudflows involve very rapid downslope movement of saturated soil, sub-soil and weathered bedrock. Debris flows also include burned or partially burned plant materials. They originate in hillside areas where the soil horizon is well developed, but the soil has poor drainage characteristics. Large mudflows may have the energy to uproot trees and to carry along boulders several feet in diameter. Because they can happen with little or no warning and because of the speed with which they move, mudflows can be quite destructive, especially along the bottom and at the mouths of canyons. Historically, mudslides have occurred in several locations within the northern portion of the City.

Dam Inundation Area



Source: California Office of Emergency Services 2007

FLOOD/LANDSLIDE GOAL

A community that is protected from floods and landslides.

OBJECTIVES AND POLICIES

The City has established the following objectives and policies for flood/landslides in Sierra Madre. The implementation measures are contained in the Implementation Chapter at the end of the General Plan.

Objective Hz6: Addressing potential flooding and landslide hazards on public and private property.

Policies:

Hz6.1

Require that all new development incorporates sufficient measures to mitigate flood hazards, including the design of containment systems to capture stormwater runoff on-site, and site grading that minimizes stormwater runoff from increased impervious surfaces, thereby addressing impacts to on-site structures and adjacent properties.

Hz6.2

Require that the landscape of open space areas provide the maximum permeable surface area to reduce site runoff, and prohibit the paving of a majority of these areas.

Objective Hz7: Providing adequate response in case of flooding emergency.

Policies:

Hz7.1

In the event of a flood, coordinate Fire Department emergency operations with the Sierra Madre Police Department, the Sierra Madre Public Works Department, the Sierra Madre Volunteer Search and Rescue Team, and other public agencies utilizing Incident Command and the National Incident Management System (NIMS.).

Hz7.2

Encourage implementation of emergency evacuation drills to prepare for the event of floods.

Objective Hz8: Maintaining adequate infrastructure to prevent flooding hazards.

Policies:

Hz8.1 Require that residential tract developers be responsible for construction of drainage/storm drain systems improvements that are compatible with City and County systems within or adjacent to their project site.

Hz8.2 Install required public storm drainage improvements.

Hz8.3 To the extent feasible, the City shall continue to cooperate with and facilitate L.A. County's maintenance efforts to keep the debris basins clean.

Objective Hz9: Maintaining updated information on flood hazards.

Policies:

Hz9.1 Obtain and make available to the public updated flood hazard maps prepared by FEMA.

Hz9.2 Evaluate studies of streams, as they become available, to identify any changes.

Section Three: Seismic Safety

OVERVIEW OF EXISTING CONDITIONS

The City of Sierra Madre is located in a geologically complex area that has a very active history of seismic activity due to the large number of faults in the region.

There are several active and potentially active faults located within, or in the vicinity of the City. The nearest active fault is the Sierra Madre Fault Zone which passes through the northern part of the City in a west-northwesterly direction. This fault zone consists of several sub-parallel branches found at the base of the mountains and within the one-quarter mile of slope above the mountain base. The Clamshell-Sawpit Fault, an off-shoot of the Sierra Madre Fault Zone, located approximately 1.5 miles east of Sierra Madre, and which generated the 1991 Sierra Madre earthquake, is a branch of the active Sierra Madre Fault Zone. Another active fault in proximity to the City is the Raymond Fault located approximately 1.5 miles to the south.

Faults are continually being found by geologists/seismologists within the region. These scientists have identified almost 100 faults in the Los Angeles area that are suspected of being capable of generating earthquakes with magnitudes of 6.0 or greater. Included within the newly discovered faults are faults that are classified as "blind thrusts". These faults do not reach the ground surface but do connect many of the known surficial faults at depth and underlie nearly the entire Los Angeles, San Fernando and San Gabriel basins. The January 1994 magnitude 6.7 Northridge Earthquake occurred on a north-dipping thrust fault connected to a buried thrust and produced severe ground motions over a wide area. It also caused 57 deaths, 9,253 injuries and left over 20,000 displaced. An earthquake on any of these many faults would represent a hazard in the region.

The U.S. Geological Survey and the Southern California Earthquake Center say that the Los Angeles area could expect one earthquake every year of magnitude 5.0 for the foreseeable future. The most likely major seismic events to affect Sierra Madre within the next 50 to 200 years most likely would occur as the result of movement along the Sierra Madre Fault, a blind thrust, or the San Andreas Fault.

A major earthquake occurring in or near Sierra Madre may cause many deaths and injuries, extensive property damage, fires, hazardous spills, and other hazards. The effects could be aggravated by aftershocks and by the secondary effects of fire, hazardous material/chemical accidents, and possible failure of the waterways and dams.

On a citywide basis, the Sierra Madre, the Raymond, a blind thrust, and the San Andreas are faults considered to represent the greatest hazard to the City. Although significant earthquakes may occur on faults other than those identified, these faults are considered most likely to cause damage in the City. The active Sierra Madre Fault Zone is the principal seismic hazard due not only to its potential for ground rupture, but also potential for seismic shaking. The consequences of strong seismic shaking are of greater significance over a far wider area than is ground rupture by active faulting.

Earthquakes are caused by the violent and abrupt release of strain built up along faults. When a fault ruptures, energy spreads in the form of seismic waves. Seismic waves are categorized into two groups: body waves and surface waves. Body waves travel through the earth's crust and eventually reach the ground interface creating surface waves. Both body waves and surface waves cause the ground to vibrate up and down and side to side at different frequencies depending on the frequency content of the earthquake rupture mechanism, the distance from the earthquake origin to a particular site, and the path and material through which the seismic waves spread.

Hazards associated with seismic waves include ground rupture, ground shaking, land sliding, flooding, liquefaction, tsunamis and seiches. The potential hazards that the City could face in an earthquake include the following:

Ground Rupture

Ground rupture represents the primary hazard associated with earthquakes since it is the initial result of seismic events. Surface rupture poses a difficult seismic problem from an engineering standpoint because it is far more expensive and complicated to design a foundation and structure to withstand the displacement of even fractions of a foot than to build without consideration of rupture. Such ground fractures can cause parallel displacement in the foundation, causing buildings to crack and split. Development should be avoided in areas of high fault rupture potential.

Ground Shaking

The most significant earthquake action in terms of potential structural damage and loss of life is ground shaking. Ground shaking is the movement of the earth's surface in response to a seismic event. The intensity of the ground shaking and the resultant damages are determined by the magnitude of the earthquake, distance from the epicenter, and characteristics of surface geology. This hazard is the primary cause of the collapse of buildings and other structures.

Increased hazards from earthquakes occur when the seismic activity occurs in a highly urbanized area. The significance of ground shaking action from an earthquake is directly related to the density and type of buildings, and the number of people exposed to its effect.

Liquefaction

Liquefaction is a phenomenon involving the loss of shear strength of soil. Liquefaction involves a sudden loss in strength of a saturated, cohesionless soil (predominantly sand) which is caused by shock or strain, such as generated by an earthquake, and results in temporary transformation of the soil to a fluid mass. If the liquefying layer is near the surface, the effects are much like that of quicksand on any structure located on it. If the layer is in the subsurface, it may provide a sliding surface for the material above it.

Liquefaction typically occurs in areas where the groundwater surface is less than 30 feet below the ground surface and where the soils are composed predominantly of poorly consolidated fine sand. There are no liquefaction zones in the City. However, during and after a severe rain, liquefaction could occur should a moderate to severe earthquake take place.

The City's policies and programs for seismic safety are designed to reduce death, injuries, damage to property and economic and social dislocation that could result from earthquakes and related geologic hazards, as well as to enhance the preparedness of City agencies and the community in general to survive, respond to, and recover from a major earthquake.

SUMMARY OF SEISMIC SAFETY GOALS

- Land development that Ensure that the land use element recognizes and addresses seismic threats when it occurs for development in areas of the City located on or along a fault.
- 2. Minimal loss of life, injury, property damage, economic and social dislocation, and disruption of vital services due to earthquakes.
- 3. A multi-hazard emergency disaster plan that includes seismic safety.
- 4. Effective citywide response to, and rapid recovery from, an earthquake.

OBJECTIVES AND POLICIES

The City has established the following objectives and policies for seismic safety in Sierra Madre. The implementation measures are contained in the Implementation Chapter at the end of the General Plan.

Objective Hz10: Assessing the viability of development based on seismic safety considerations Close coordination of the objectives and policies of the seismic safety element with those of the land use element.

- Hz10.1 Require that earthquake survival and efficient post-disaster functioning be a primary concern in the siting, design and construction standards for essential facilities in Sierra Madre.
- Hz10.2. Investigate the limitations on the location of new or altered residences and critical, sensitive and high occupancy facilities in areas near active faults (e.g. the Sierra Madre Fault Zone), and consider conducting a comprehensive geologic investigation to show where active faults pose a hazard to structures.
- Hz10.3 Investigate requiring that proposed new or altered residences and critical, sensitive, and high occupancy facilities located in areas near active faults (e.g. the Sierra Madre Fault Zone) are not approved unless necessary subsurface fault investigations have first been completed.
- Hz10.4 Investigate requiring a thorough subsurface fault investigation be conducted for any proposed habitable structure on private property in close proximity of an active fault zonethe Sierra Madre Fault Zone, and monitor any trenching for public buried water lines in the same area. Assign a City employee the duty of collecting and assessing of data gathered from the above listed efforts with help of a registered geologist.
- Hz10.5 Create a central depository of all Sierra Madre geologic information the City obtains through any project approvals process, including any governmental projects.

Objective Hz11: Minimizing to the extent possible the loss of life, serious injuries, and major social and economic disruption caused by the collapse of or severe damage to vulnerable buildings in an earthquake.

Policies:

Hz 11.1 Promote public awareness of the need to upgrade seismically hazardous buildings for the protection of health and safety in the City.

Hz 11.2 Encourage seismic review of buildings. 🎏

Hz 11.3 Promote seismic upgrading of older residential and commercial structures with special attention given to historic structures.

Objective Hz12: Enhanced preparedness by City agencies and the community to respond to and recover from a major earthquake.

Policies:

Hz 12.1 Maintain and update multi-hazard emergency preparedness plan for the City that includes seismic safety.

Hz 12.2 Maintain and upgrade the City's disaster response plans at least annually, conduct periodic tests of their practicality and effectiveness, and involve residents and business in the preparation and testing of the plans.

Hz 12.3 Prepare and disseminate to residents and businesses information regarding seismic risks affecting the City, measures to protect life and property before and during an earthquake, and emergency procedures to follow after an earthquake.

- Hz 12.4 Incorporate planning for potential incidents affecting critical, sensitive and high-occupancy facilities into the City's contingency plans for disaster response and recovery.
- Hz 12.5 Ensure that emergency preparedness is the mutual responsibility of City agencies, City residents and the business community.
- Hz 12.6 Develop and implement ongoing City-wide programs for disaster preparedness and recovery planning.

Objective Hz 13: Effective implementation of seismic policies.

- Hz 13.1 Provide residents and business owners with a continuing awareness and expanding knowledge of the seismic hazards affecting the City.
- Hz 13.2 Adopt and maintain high standards for seismic performance of buildings, through prompt adoption and careful enforcement of the best available standards for seismic design.

Section Four: Noise

OVERVIEW OF EXISTING CONDITIONS

Sound is a disturbance in air pressure. It may be interpreted in different ways depending on one's perception and may be described in qualitative or quantitative terms. Qualitative terms describe the noise in <u>terms</u>stems such as loud, soft, noisy, quiet, annoying or pleasant.

Quantitative descriptions of sound permit the application of noise standards and criteria as well as measures to mitigate noise impacts. Quantified measurements of sound involve three primary characteristics: Amplitude, frequency, and temporal pattern or duration. Amplitude is the sound pressure measured in Decibels (dB). Decibels are based on a logarithmic scale in order to compress the wide range of sound intensities. Frequency is the rate at which the sound source vibrates or causes the air to vibrate. The frequency in sound measured in Hertz (Hz) which is the number of cycles per second. Temporal pattern or duration is the length of time associated with a sound (e.g. continuous, intermittent, fluctuating, etc.)

Human perception of sound also depends on the time of day when the sound occurs. Sound levels that normally occur during daylight hours and that are not considered objectionable may be excessive when they occur at night. The use of frequency-weighted sound measurement estimates the human perception of noise or annoying sounds. Frequency weighing is expressed in terms of A-weighted decibels dB(A). It de-emphasizes the very low and very high frequency ranges of sound and places greater emphasis on frequencies within the sensitivity range of the human ear.

Generally, outdoor noise levels are highly variable. Levels (Ldn) occur as low as 30 to 40 dB(A) in wilderness areas as high as 85-90 dB(A) in urban areas. A normal suburban community would have a typical ambient noise level of 50-60 dB(A), a very noisy residential area, up to 70 dB(A).

In residential areas, major contributors to outdoor noise are transportation, industry, construction, gardening equipment, and human and animal sources. Population density is a primary determinant of ambient noise levels. Based on the population characteristics of Sierra Madre, the City would be considered as a normal suburban community with a typical noise level of 55 dB(A) as described above. In addition to the outdoor noise, additional exposure of humans to noise results from sources inside homes (e.g. appliances, radio and television, people and animals) and sources in the workplace, especially from mechanical and electronic equipment.

Sierra Madre has a noise ordinance in effect that seeks to protect the citizens of the City from excessive, unnecessary and unreasonable noises, and contains policies to control the adverse effects of noise. The ordinance determines allowable noise limits in terms of the "Local Ambient" noise level.

Sierra Madre is primarily a residential community with no major highway, freeway or other transportation corridors traversing it. The City contains 30.4 acres of land devoted to commercial uses constituting stationary sources of noise. As such, stationary noise in Sierra Madre is considered minimal and located in the City center, primarily along Sierra Madre Boulevard west of Baldwin Avenue to Lima Street and east of Baldwin Avenue to Mountain Trail Avenue. Along these roadway segments are included typical commercial establishments such as retail stores, restaurants, etc. Some additional commercial uses are found east of Baldwin Avenue on Montecito Avenue, including small warehousing establishments and small machine-shops. The Interstate 210 (I-210) Freeway is considered a significant source of noise for the City given its proximity (about 1.25 miles south). Although some studies claim noise from the I- 210 Freeway is not significant, residents of the City consider it to be a significant source of noise because freeway noise is amplified by the topography of the area.

As mandated by the State, noise sensitive receptors must be identified for a particular jurisdiction. A sensitive receptor is any area containing schools, hospitals, rest homes, long-term medical or mental care facilities, or any other land use deemed noise sensitive by the local jurisdiction. In Sierra Madre, the existing schools are considered sensitive land uses. There are no hospitals

or mental care facilities located in Sierra Madre; however, there are board and care facilities that are considered a sensitive land use.

NOISE GOAL

A City where the adverse effects of noise on residents are prevented and/or minimized.

Objective Hz14: Maintenance of the quiet residential character of the City, free from excessive noise from transportation or fixed source generators.

- Hz14.1 Formulate measures to mitigate noise impacts from mobile and stationary noise sources through compatible land use planning and the discretionary review of development projects.
- Hz14.2 Identify and control the noise levels associated with transportation and general circulation patterns in the City to ensure the residential quality of the community.
- Hz14.3 Enact noise regulations to prohibit unnecessary excessive and annoying noise sources. These controls currently relate to the general category of disturbing- the-peace nuisances.
- Hz14.4 Ensure that the noise level of the commercial districts does not interfere with the normal business, commercial or residential activities.
- Hz14.5 To the extent possible, protect schools, hospitals, libraries, churches, parks and recreational areas from excessive sound levels so as not to adversely affect their normal activities.
- Hz14.6 Review current guidelines regarding the use of gas powered lawn equipment and consider restricting

the type of equipment, hours and duration of operation.

Objective Hz15: Minimizing the noise impacts associated with the development of residential units above ground floor commercial uses.

Policies:

Hz15.1 Require that commercial uses developed as part of a residential mixed-use project are not noise intensive.

Hz15.2 Design mixed-use structures to prevent the transfer of noise from the commercial use to the residential use.

Hz15.3 Require that common walls and floors between commercial and residential uses be constructed to minimize the transmission of noise and vibration.

Objective Hz16: Minimizing the impacts of construction noise on adjacent uses.

Policies:

Hz16.1 Continue to require that construction activities be limited to reasonable weekday and weekend/holiday hours in order to reduce noise impacts on adjacent residences.

Hz16.2 Require that construction activities incorporate feasible and practical techniques to minimize the noise impacts on adjacent uses.