G. Safety

1. Goals and Opportunities

Responding successfully to natural and man made emergencies requires analysis of existing hazards and planning. In addition to addressing geologic hazards, the Safety Element addresses other natural and urban safety issues. The following goals have been established to improve public safety within the City of Norwalk:

- To reduce the City's loss of life, injury, and economic, social and environmental losses.
- To implement an effective and successful emergency preparedness plan that will minimize loss of life, injury, economic and

social dislocation.

- To ensure the availability and effective response of emergency services.

2. Natural Hazards

a. Seismic Hazards

Geological hazards in the Norwalk area are essentially limited to those caused by earthquakes. The major cause of damage from earthquakes results from violent shaking. Three major earthquakes and numerous minor earthquakes have affected the Norwalk area in the last 178 years. Major earthquakes include the Southern California quake of 1812; the Long Beach earthquake of 1933, and the Whittier Narrows earthquake of 1987. The City of Norwalk is within 7 miles to two active or potentially active faults that have the potential for producing earthquakes. Violent shaking would cover not only the area immediately adjacent to the earthquake epicenter but also areas for many miles in all directions.

Since Norwalk is susceptible to a catastrophic earthquake, the City should consider the associated risks. There are two types of risk associated with seismic hazards: unacceptable and tolerable. Unacceptable risk encompass conditions that can not be tolerated and toward which government actions and programs should focus. Tolerable risks is assigned to perceived threats that pose some danger but are tolerable until programs and resources are available for their abatement. Tolerable levels are achieved by complying with County, State and Federal Safety standards and policies.

Strong Ground Shaking - Earthquakes are caused by violent and abrupt releases of strain built up along faults. The most damaging earthquakes are associated with rupture across very large surface of pre-existing faults.

A sudden slip along all or part of a fault surface within the earth's crust releases elastic strain energy that has accumulated within nearby rocks and radiates that energy in the form of earthquake waves. Vibrational waves are propagated large distances away from the fault. As they pass though an area, they produce the shaking effects that are the predominant cause of earthquake damage. The severity of ground shaking at any point depends upon the size of the quake, the distance to the ruptured part of the fault plane and the local geologic condition that either amplify or attenuate the earthquake waves.

Faulting - A fault is a fracture within the earth's crust along which significant movement has occurred rather suddenly during earthquakes or slowly. Because different faults can lie dormant for different lengths of time before they slip again, there is no universally applicable time span for evaluating fault activity. Both historical and geologic evidence suggests that some faults may remain dormant for hundreds to thousands of years between major displacements.

When a slip along a fault plane extends to the Earth's surface the effects can have profound significance for buildings, pipelines and other structures that straddle across the fault trace. These effects include rupture and offset of the land surface, local warping and lifting of the ground near the fault trace. These ground deformations can damage or even destroy buildings.

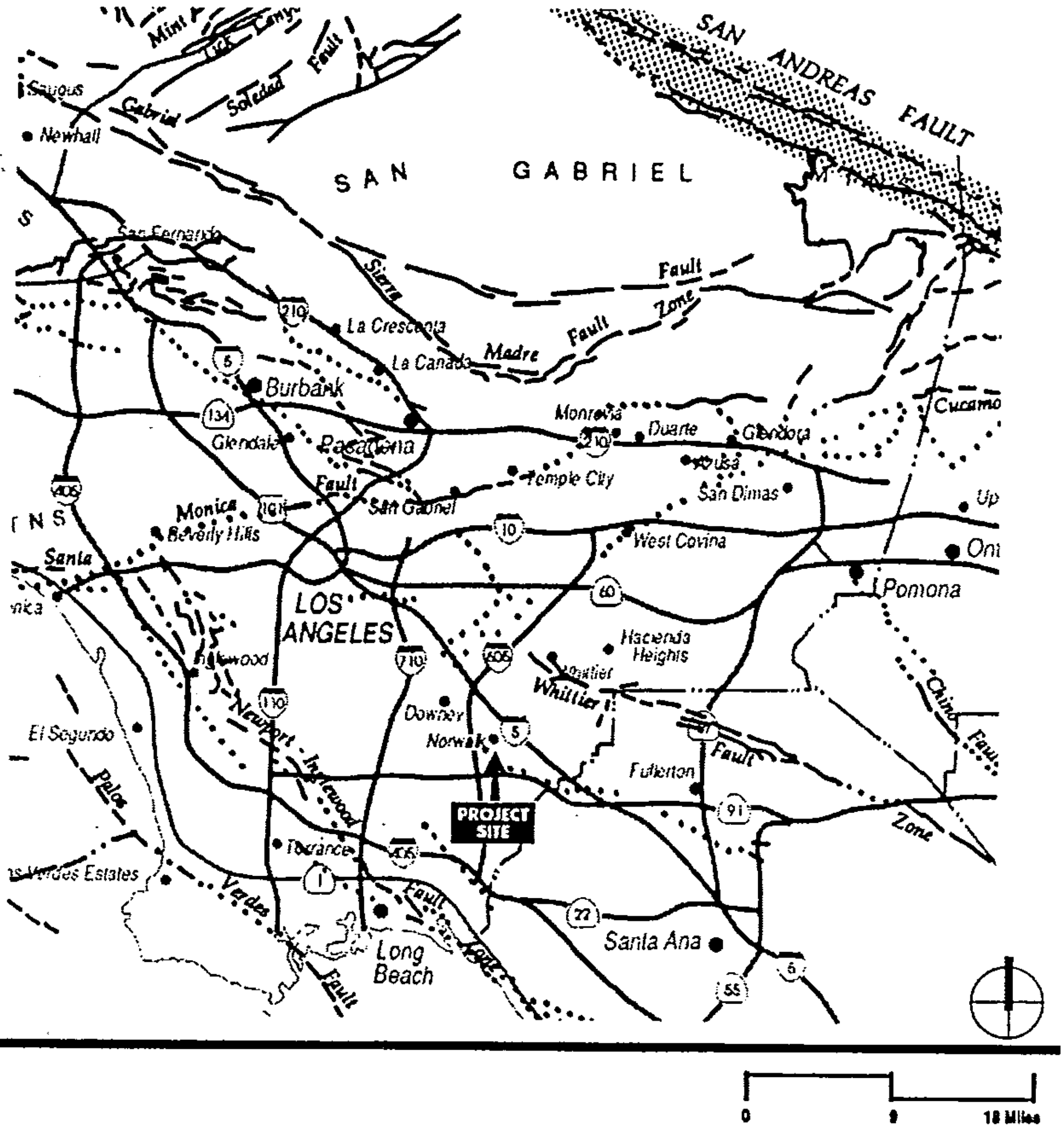
Large, shallow earthquakes in California are commonly accompanied by surface faulting or deformation. In general, surface faulting is associated with earthquakes having an epicenter shallower than 15 km. below the surface and magnitudes greater than 5.5.

Earthquake faults are categorized as active, potentially active, and inactive. An active fault has exhibited surface displacement within Holocene time (approximately the past 11,000 years). A potentially active fault shows evidence of surface displacement during the last 2 million years, or Quaternary time.

One potentially active fault runs through the City of Norwalk and an active fault is located within close proximity. The Norwalk Fault is classified as a potentially active fault and runs through the southeastern region of the City . It is at least 14 km long and is considered to have a very low probability of producing severe earthquakes due to its lack of seismic activity. The fault is noted as the possible source of the

1929 damaging earthquake.

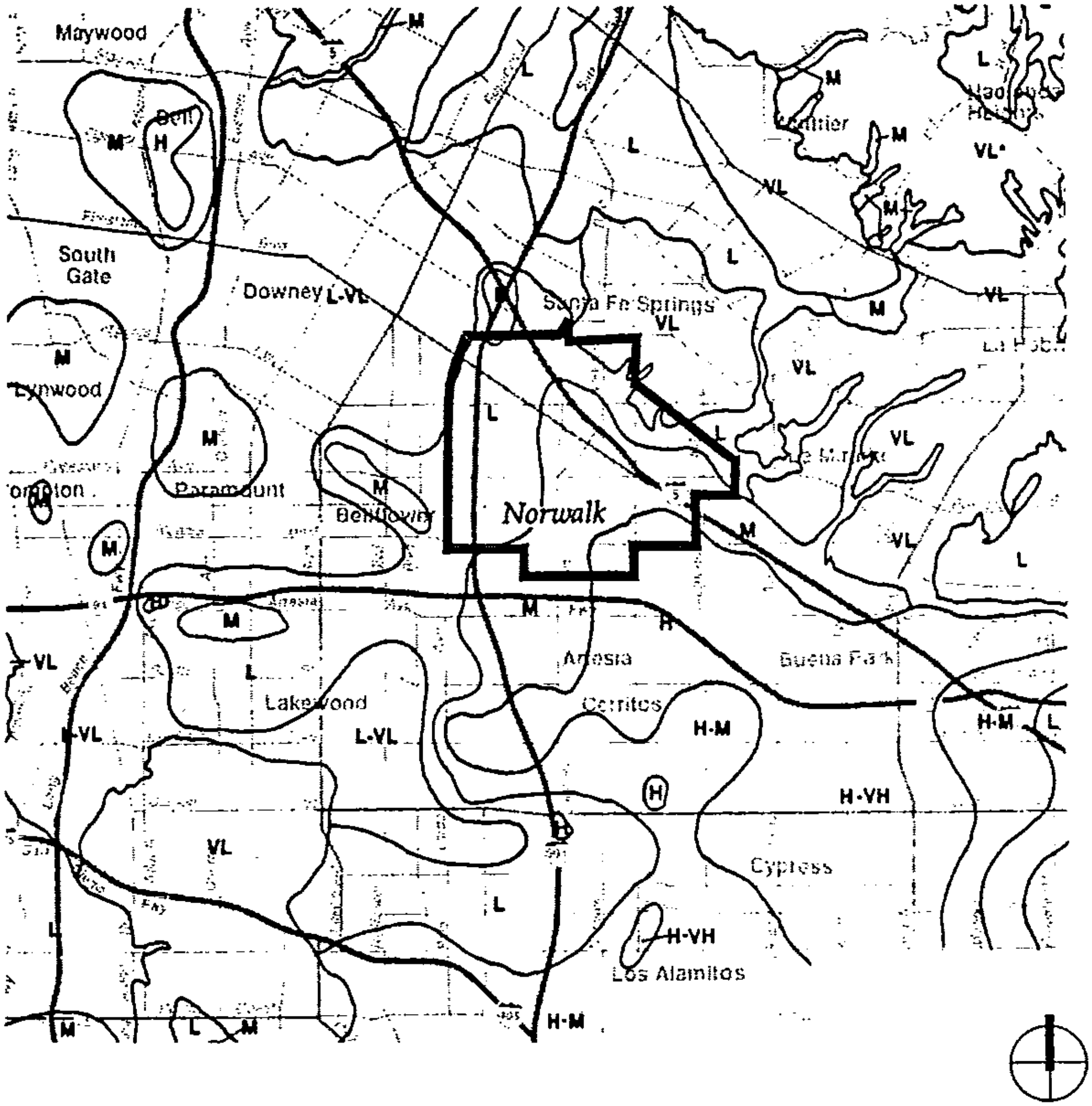
The Newport Inglewood Fault is an active fault located approximately seven miles south of the City and is capable of producing an earthquake of 6.5 Richter magnitude. It is approximately 43 km in length and has a slip rate between 0.1 and 6.0 mm/yr. Other faults such as the Raymond, San Fernando, Santa Monica, and Sierra Madre are also capable of producing earthquakes of this magnitude, but impacts of ground shaking would be less due to their distance from the City of Norwalk.



Map of Faults in Vicinity of Norwalk

Liquefaction - When an earthquake produces repeated pulses of strong ground motion, liquefaction can occur in an area of high ground water and loose, granular sediments. As the ground shakes, granule sediment becomes saturated as the water is forced to the surface, and transforms from a solid to a liquid. Although the City of Norwalk is located in an area of low to moderate relative liquefaction, ground failure due to liquefaction could be a potential hazard for buildings, utilities, and other facilities in the southeastern region of the City.

There are four types of ground failure associated with liquefaction: lateral spread; flow failure; ground oscillation, and loss of bearing strength. Lateral spread occurs on gentle slopes ranging from 0.3 - 3 degrees and can be tens of meters wide. Ground oscillation takes place at depth and if the slopes are too gentle to permit lateral displacement. Following liquefaction at depth, overlying soil blocks that have not liquefied may decouple from one another and oscillate on the liquefied substrate. The resulting ground movement often resembles a traveling ground wave. Overlying structures and subgrade facilities commonly sustain damage through this mode of ground failure. Flow failure is the most catastrophic mode of ground failure that results from liquefaction. It usually occurs in areas with slopes greater than 3 degrees. It commonly displaces soil masses by tens of meters and can displace material at velocities of 10 kms. per hour. Loss of bearing strength can occur under a structure where the soil loses strength and liquefies. Large deformations can then occur within the soil mass and allow buildings to tip. The depth of ground water can change over seasons and over the span of several years; therefore, longer-term data on ground water levels is needed for a more accurate perspective on liquefaction potential in the City of Norwalk.



LEGEND

VH	Very High	L	Low
H	High	VL	Very Low
M	Moderate	VL*	Bedrock Areas

0 1 2 4 Miles

Heavy structures tend to settle or overturn during liquefaction which can lead to severe structural and foundational distress. Structures may settle several feet below grade while buried tanks or other buoyant infrastructure may rise to the surface.

Because not all soil types are susceptible to liquefaction, site specific studies evaluating the potential for liquefaction at any given building site are necessary. Most liquefaction problems can be resolved for new construction through proper identification of the problem and appropriate foundation design.

Hazardous Buildings - A hazardous building is one which may be hazardous to life in the event of an earthquake because of partial or complete collapse. Building types which may pose substantial hazards in an earthquake include: buildings constructed of unreinforced masonry, precast concrete tilt-up buildings, multi-story buildings of non-ductile concrete frame, and buildings of composite precast construction.

Critical, Sensitive and High-Occupancy Buildings - Some facilities pose a greater degree of importance or risk to the public and may warrant special standards for a variety of reasons. Two general categories of facilities pertinent to City of Norwalk are distinguished for policy purposes:

Critical Facilities are those facilities which either provide emergency services or house or serve many people who would be injured or killed in case of disaster, damage to the facility. Examples of critical facilities include fire stations, police and emergency service facilities, utility facilities, and hospitals.

Sensitive Facilities include facilities used for the manufacture, storage or sale of hazardous materials, such as the Defense Fuel Supply Point, as well as socially significant facilities such as schools, nursing homes, and housing for the elderly, handicapped or mentally ill.

Locating and designing public schools falls under the approval authority of the Office of the State Architect, which enforces the States' strong seismic codes for those facilities. Specifications and enforcement of seismic standards for other uses is the responsibility of the City.

Seismic Policies - Although earthquake damage is inevitable in the Los Angeles region, damage can be reduced by adopting policies that avoid or accommodate the potential effects of earthquakes. Some earthquake hazards like fault rupture have definite area limits and can be avoided by careful land-use planning. Attempts should also be made to design and build structures that will accommodate distortion and minimize the possibility of life-threatening ground failures. Whatever strategy is selected, various levels of government, private groups, corporations, and quasi-public organizations can play important roles in reducing seismic hazards and damage.

Land Use development based on sound information about earthquake hazards and implemented over an extended period of time can be among the most effective means for saving lives and minimizing disruptions in case of an earthquake. Proper land use planning would include provisions for the best possible location, density and arrangement of land use.

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.

Effective implementation of seismic policies requires a continuing awareness and expanding knowledge of the seismic hazards affecting the City; strong enforceable seismic standards for the siting, design and review of proposed development; and progressive City-wide programs for disaster preparedness and recovery planning.

Site-specific investigation of geologic and soil conditions are the primary means of hazard evaluation and an important basis for effective mitigation through the planning and design of individual development projects. Data collection for an individual development site does not necessarily provide a complete picture of the geologic hazards affecting the site. A broader data base of geologic and soils information, derived from a variety of development and excavation projects, would provide consultants and reviewers with a broader perspective and significant insights on potential development hazards.

b. Other Natural Hazards

Due to the flat topography of the area, the City of Norwalk is not affected by avalanches, rockfalls or landslides. Given its inland location, the potential for tsunamis and seiches in the City of Norwalk is extremely low.

The City of Norwalk is classified as a Zone C flood region according to the Flood Insurance Rate map (FIRM) for the County of Los Angeles. Zone C classification indicates that the City is located in an area susceptible to a flood occurrence within a 500 year period.

The City is located downstream from the Whittier Narrows Dam. As indicated on Plates 1 and 2 of the Whittier Narrows Dam Emergency Plan Inundation Map, prepared by the U.S. Army Engineer District, Los Angeles, Corps of Engineers, the majority of the City, including all property west of Norwalk Boulevard, would be subject to inundation due to dam failure. The northern boundary of the City of Norwalk is approximately 6.97 miles from the Whittier Narrows Dam. Assuming complete failure of the dam, and peak capacity at the time of failure, the City of Norwalk would be affected within 6 hours, while peak inundation would occur within approximately 19.25 hours. Water levels could approach between 4-6 feet in depth above ground level. In preparing the Multi-Hazard Functional Plan, the City should consider this hazard before siting emergency shelters after seismic activity.

3. Man Made and Urban Hazards

a. Fire

The County of Los Angeles Fire Department provides fire protection services to the City of Norwalk. There are two fire stations located within the City. The Fire Department reviews certain development and subdivision plans to ensure that preventive fire measures and adequate Fire Department access can be provided.

b. Other urban hazards

Crime is also an urban hazard that must be considered, since it directly affects the safety of residents. Crime prevention and other police activities are performed by the County of Los Angeles Sherrif's Department. In addition, the City of Norwalk Public Safety Department provides community services related to crime. To ensure that crime issues are adequately addressed, the County of Los Angeles Sherrif's Department should be consulted for their comment and suggestion regarding development or other land use applications. Public Safety will continue to provide safety related services.

4. Emergency Preparedness

The County of Los Angeles Fire and Sherrif's Department are prepared to respond to the day-to-day urban hazards.

The City should continue to evaluate its ability to respond to natural hazards, in concert with the State of California Office of Emergency Services, and other agencies. Comprehensive plans for dealing with the effects of large earthquakes are particularly important because such events are different from other disasters in that they are infrequent, usually unexpected and potentially catastrophic.

Effective implementation of seismic policies for dealing with the effects of large earthquakes will help reduce the magnitude of damage in the event of an earthquakes but a variety of damage should still be anticipated. Effective response to a disaster or to a warning of disaster is essential to life saving and the reduction of subsequent property damage and social dislocation.

The emergency response capabilities of the City are geared primarily to non-disaster incidents, and police and fire capabilities could be overwhelmed in a large disaster.

In a major earthquake, mutual aid sources in adjacent jurisdictions are likely to be fully committed to their own needs, and there may be substantial delays in the request and transport of assistance from more distant locations. Access to and egress from the city is likely to be inhibited by earthquake damage and related congestion and accidents.

Effective disaster preparedness will require the concerted efforts of city agencies, residents and the business community. Not only must effective plans and procedures be in effect, but those plans should be tested and improved through frequent disaster exercises. To ensure an organized response to a natural or urban hazard, the City should prepare a multi-hazard functional plan.

Planning for Post-Disaster Recovery

Ultimately, the potential for post-earthquake survival in the City of Norwalk will depend not only on the effectiveness of hazard mitigation and disaster response programs, but also on how quickly and how well the city is rebuilt after a major earthquake. With preplanning, effective programs and options for rapid reconstruction, Norwalk would be able to coherently and efficiently begin to restore itself immediately after an earthquake.

3. Objectives and Policies

a. Safety from Natural and Man Made Hazards

Objective

- To avoid unnecessary exposure to hazards and continue operation of critical facilities after an emergency.

Policies

- Adopt and maintain high standards for seismic performance of buildings through prompt adoption and careful enforcement of appropriate building codes for seismic design.

- Establish mitigation of earthquake hazards as a high priority for City programs both before and after an earthquake.

- Consider seismic requirements when determining the location and design of critical, sensitive and high-occupancy facilities.

- Encourage preservation and sensitive re-use of historic buildings that need strengthening for protection from seismic hazards in a manner that does not endanger public safety.

- New development and other land use entitlements should be reviewed by emergency response agencies to ensure that public safety can be adequately provided.

b. ***Emergency Preparedness and Post-Disaster Recovery***

Objective

- To prepare the City for effective response to catastrophes.

Policies

- Maintain and revise a multi-hazard functional plan to serve as the comprehensive emergency operation plan.

- Ensure that emergency preparedness is the mutual responsibility of City agencies, residents and the business community.

- Continue support of mutual assistance between the City and other governmental agencies and municipalities.

- Promote increased awareness of seismic and other public safety problems and programs.

- Promote and develop community and workplace self-help and disaster relief groups to improve effectiveness of local emergency response, light search and rescue, and emergency medical care.

- Promote improved cooperation with non profit and private sector emergency response organizations.

- Support Federal and State legislation to develop an adequate earthquake insurance program that includes mitigation measures.

4. Implementation Programs

a. Safety from Natural and Man Made Hazards

- Continually review and strengthen codes and ordinances dealing with hazardous housing, building conditions and fire safety.

- Develop a mechanism for the removal or rehabilitation of hazardous or substandard structures which may be expected to collapse in the event of an earthquake including, but not limited to unreinforced masonry buildings.

- Require geotechnical evaluation, prior to site development in seismically hazardous areas as mandated by State law.

- Develop standards and restrictions such as limits on allowable land uses, density standards, and subdivision design policies for sites subject to seismically induced liquefaction or soil compaction.

- Consult the County of Los Angeles Sheriff's Department and Fire Department or any other emergency response agency during review of development projects or land use entitlement applications.

- Continue to provide safety related services through the City of Norwalk

Department of Public Safety.

b. Emergency Preparedness and Post-Disaster Recovery

- Develop programs and procedures for immediate disaster relief, shelter, and preliminary reconstruction.

- Develop programs, options, and procedures to promote rapid short-term reconstruction of the City following an earthquake.

- Develop a contingency plan for long-term reconstruction activities in areas potentially subject to significant damage.

- Provide and publicize psychological relief offered by appropriate agencies (or private practices) following strong seismic event.

- Identify alternative sources of financing of damage and reconstruction.