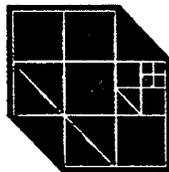

SAFETY ELEMENT

Los Angeles County General Plan

department of
REGIONAL PLANNING

county of los angeles



December, 1990

SAFETY ELEMENT

LOS ANGELES COUNTY GENERAL PLAN

Adopted by:

The Board of Supervisors

December 6, 1990

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FOREWORD

The Board of Supervisors adopted the first Safety and Seismic Safety Elements as components of the Los Angeles County General Plan in 1975. The revised Safety Element, presented in the following pages, responds to new knowledge and concepts gained from studies of safety related issues and events; and from experience gained through management of public safety since 1975. This revised Element combines the formerly required Safety and Seismic Elements into one document in accordance with current State law.

SUMMARY OF THE BASIC PRINCIPLES OF THE SAFETY ELEMENT

The following principles constitute a summary of the content of the Safety Element.

- The Safety Element is basically a long range emergency response plan. It seeks to reduce future losses of life, injuries and socioeconomic disruption by design of safer environments and facilities; by avoidance of hazardous sites; by removal or strengthening of unsafe structures; and by promotion of preparedness for emergencies.
- The Safety Element addresses earthquake, landsliding, flood and fire hazards; and potential hazardous materials incidents related to these hazards.
- Implementation of the Safety Element is the responsibility of many County agencies including the planning agency.
- A basic function of the Safety Element is to increase public awareness and support of safety-conscious planning.
- County decision makers can make one of their foremost contributions to public safety by review of proposed public and private developments under their jurisdiction to ensure that developments are sited, designed and built in a manner which will minimize exposure to the hazards identified above.
- Review of projects for development of critical facilities (examples are public safety facilities, hospitals, child care facilities and elderly care facilities) offers major opportunities to improve public safety and avoid loss of life and injury through careful review of siting, design and construction.
- Hazardous structures (substandard buildings, freeway overpasses, bridges, dams, etc.) have the greatest potential to cause loss of life, injuries, and socioeconomic disruption and loss. Abatement of hazardous structures through strengthening or removal should receive the highest priority.
- Major emergencies will require all the available resources of the various levels of government cooperatively applied.
- Public agencies and actions alone cannot achieve or pay for a safer environment. The general public, individuals, communities, businesses and non-profit or volunteer organizations must be persuaded to invest in safety improvements and actively prepare for emergency events.

- Safety costs must be allocated fairly. No group must be unfairly penalized. Costs incurred are investments which should be designed to prevent larger future losses. Conversely, deferral of investments in safety may lead to major future losses of life, injuries, heavy costs and socioeconomic disruption. The issue of costs should be addressed in a study of the relative priority and financing of actions recommended in the Element.

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A. INTRODUCTION

The Safety Element is a required component of the Los Angeles County General Plan. Prepared in accordance with Sections 65302(g) and 8875 of the California Government Code, the Element assesses threats to public health and safety from a variety of hazards and recommends strategies to reduce these threats. Because local jurisdictions have a degree of discretion in tailoring the Safety Element to their particular concerns, the serious threat of earthquakes to Los Angeles County has influenced the emphasis on earthquake-induced hazards in this document. Consideration of the topics discussed in the text, suggests that many actions that reduce the risk from earthquakes also contribute to reduction of risks from fire, flood, and geologic hazards and vice versa. The following subjects are addressed in the Safety Element:

- . Seismic hazards: surface rupture, ground shaking, and ground failure;
- . geologic hazards: slope instability, landslides, and unstable ground;
- . flood and inundation hazards: structural failure of water storage facilities, tsunami, seiche, and rain-induced flooding;
- . wildland and urban fires; and
- . other safety issues including the management of hazardous materials, potentially hazardous buildings, critical facilities, emergency response resources, and safety oriented research.

The Safety Element is only one component of the General Plan. Although the basic objective of the Element is "to reduce death, injuries, and property damage, economic and social impact from hazards" and is of paramount concern; other social, economic, political, and aesthetic factors must be considered and balanced with safety needs. The Safety Element, therefore, is designed to be consistent with the other elements of the General Plan, including the Housing, Economic Development, Land Use, Transportation, and Conservation and Open Space Elements.

This document is intended to provide guidance to the public about policies and actions which can produce a safer environment. It is specifically designed to present public officials with program options suitable for consideration in making decisions regarding projects, regulations and programs which further public safety; and to assist County agencies in meeting their public safety responsibilities. Although the Element applies primarily and directly to the unincorporated areas of Los Angeles County, it may also serve as a useful reference and model for the cities within the County. The threat of natural hazards to Los Angeles County can never be totally eliminated. The implementation of the Safety Element, however, can significantly reduce the magnitude of impacts from a variety of future disasters.

B. BACKGROUND AND ISSUES

Los Angeles County is the center of the largest population concentration on the Pacific Coast. Currently, more than 8.5 million residents reside in the County with population projected to reach nearly 10 million by the year 2010. Large scale urban growth will continue to create pressure on the natural and physical environments in the County, as the importance of the region as a key industrial, commercial, and cultural center continues to expand. Intensification of land uses throughout the urban area, and the extension of development into areas with environmental constraints will further increase the vulnerability of Los Angeles County to seismic, geologic, flood, and fire hazards. These trends emphasize the need to implement prudent land use, hazard abatement and risk management programs.

Los Angeles County utilizes two dimensions of risk in applying programs in the Safety Element: unacceptable risk for those conditions which cannot be tolerated and toward which the government actions and programs should be focused; and tolerable risk for those perceived threats that pose some danger, but that are tolerated until such time as programs and resources are available for their abatement. It is the County's responsibility to identify hazardous conditions that expose the public to unacceptable levels of risk and to cooperate with other levels of government and the public to reduce them to tolerable levels. Tolerable levels of risk are achieved through compliance with County, State and Federal safety standards and policies.

The Element and implementation program are organized to address major safety problems and related issues. These include hazards associated with seismic events; geologic instability; fire safety (both wildland and urban fires); flooding and inundation; hazardous materials, especially those related to the hazards identified above; emergency response, preparedness and recovery; and research and safety information systems. The following paragraphs give a brief introduction to these subjects. The Safety Element Technical Appendix, entitled Hazard Reduction in Los Angeles County, provides a technical discussion of these subjects.

Seismic Hazards

Damaging earthquakes are a fact of life in the Los Angeles region. Since 1800, 54 damaging earthquakes have jolted the Los Angeles region. Within the County itself, there are over 50 active and potentially active fault segments, and an undetermined number of buried faults, potentially capable of producing damaging earthquakes.

No area in the County is free from the widespread potential for severe ground shaking by the catastrophic "Big One", an earthquake which could occur on any one of several major faults in or near the County. Equally severe damage from earthquake-induced ground rupture, ground failure, and landsliding threaten more localized areas. In addition, flooding of low-lying coastal areas could result from a tsunami generated by a large offshore earthquake or submarine slide.

Widespread and localized earthquake-induced effects place structures or utility lifelines at risk that, if damaged, could result in fires, failure of large dams, or release of toxic, flammable, or explosive materials. Projected losses of billions of dollars and estimated casualties in the tens of thousands would surpass the effects of any previous natural disaster in the United States including the Loma Prieta (Bay Area) Earthquake. A catastrophic earthquake would severely strain the emergency response and recovery capabilities of Federal, State, and local governments; and profoundly impact the economy of the State, the nation, and possibly the world for an extended period. This Element seeks to significantly reduce the impacts from such catastrophic losses, since they are clearly unacceptable.

Geologic Hazards

With more than 50 percent of the County in hilly or mountainous terrain, and with much existing development and new growth being accommodated in these areas, the County recognizes hillside hazards as a major problem. Mud and debris flows, active deep-seated landslides, hillside erosion and man-induced slope instability comprise the vast majority of hillside hazards. The causes are many and encompass predevelopment and post-development problems; artificially saturated or rainfall-saturated slopes; the erosion and undercutting of slopes; earthquake-induced rockfalls and shallow failures; and natural or artificial compaction of unstable ground. While elimination of all losses from geologic hazards is unrealistic, large scale losses cannot be tolerated.

Flood and Inundation Hazards

Flooding within the County can be earthquake-induced or can result from intense rainfall. Although the likelihood for the catastrophic inundation of the low-lying coastal areas of the County by tsunamis is considered relatively low, the risk of losing the vital commerce associated with the number one port facility in the United States warrants adequate risk-reduction measures. Similarly, inundation caused by a catastrophic dam failure could devastate large areas of the County and threaten many residences and businesses. Two dam failures and one near failure have occurred in the County since 1928. Frequently occurring, intense storm events have also caused mudflow and flood hazards involving the destruction of property, injuries and deaths. It is County policy to minimize the losses and risks from major flood-related events.

Fire Hazards

This Element addresses the threat from both wildland and urban fires. Los Angeles County is susceptible to wildland fires because of its hilly terrain, dry weather conditions, and the nature of its plant cover. The Forester and Fire Warden has designated woodland and brush areas with high fire potential as Fire Zone 4 and a variety of regulatory programs and standards are directed toward the abatement of this hazard and reduction of risk to tolerable levels.

Because of the intensity of development, the numbers of the potentially affected population, and the difficulties of containment, the County must devote major resources to controlling potential fire hazards in its urban areas. Fire safety and suppression are especially critical in industrial areas and high-rise (more than 75 feet in height) buildings. Because high-rise structures typically occur in intensely developed settings and accommodate large numbers of occupants, the potential for fires in these structures to create major catastrophes is significant. Moreover, height limitations of fire fighting equipment makes fire suppression in high-rise buildings unusually challenging.

Hazardous Materials

Los Angeles County is especially vulnerable to unauthorized releases of hazardous materials. The County is one of the nation's largest industrial centers and a major producer of a wide variety of toxic, flammable, and explosive materials. A surprising variety of toxic materials is also stored and used in many small businesses and households. Earthquakes, fires, and floods increasingly involve the possibility of hazardous materials releases or explosions. A chlorine gas release resulting from the 1987 Whittier Narrows earthquake emphasized this potentially catastrophic problem.

Please note that the Safety Element addresses only limited aspects of hazardous waste and materials management, i.e., those aspects related to seismic events, fires, and floods. Hazardous materials management is more fully addressed in the County Hazardous Waste Management Plan, adopted by the Board of Supervisors in 1989, and in Title 2 of the Los Angeles County Code.

Emergency Response, Preparedness and Recovery

The Safety Element is essentially a long-range emergency response, preparedness and recovery plan. It provides a policy framework for the implementation of short-range emergency preparedness plans. These include the Five-Year Plan for Earthquake Preparedness and the County Multihazard Functional Plan. More importantly, all of the policies and recommendations of the Element are aimed at producing a safe environment and easing the task of disaster response organizations during emergencies. In short, the Element seeks to strengthen short- and long-term emergency response and recovery capability.

Research and Safety Information Systems

An important function of the Element is to identify safety research needs and opportunities. An important data base is already available within County agencies with immediate applications in safety planning and emergency response operations. Better geologic and seismic information, including information on the location and occupancy of hazardous structures and critical facilities, could lead to measures which would greatly reduce loss of life, injuries and property damage during emergencies. Improved fire and flood hazard data bases are also a necessity. In addition, there is a need to improve hazard prediction and early warning capability.

C. SAFETY ELEMENT GOALS AND POLICIES

SEISMIC HAZARDS

Goal: Minimize injury and loss of life, property damage, and the social, cultural, and economic impacts caused by earthquake hazards.

- Policies**
1. Encourage the use of nonurbanized segments of active fault zones for rural and open space purposes.
 2. Review projects proposing expansion of existing development and construction of new development, especially critical facilities, and encourage them to avoid localities exposed to high earthquake hazards through such techniques as cluster development and transfer of development rights.
 3. Continue enforcement of stringent site investigations (such as seismic, geologic, hydrologic, and soils investigations) and implementation of adequate hazard mitigation measures for development projects in areas of high earthquake hazard, especially those involving critical facilities. Do not approve proposals and projects which cannot mitigate safety hazards to the satisfaction of responsible agencies.
 4. Promote the development of seismically resistant major lifelines serving Los Angeles County and connecting it to surrounding regions and the rest of the nation.
 5. Promote the strengthening or replacement of critical facilities; and the retrofitting or abatement of potentially hazardous buildings, highway structures, and dams and reservoirs which do not meet seismic safety standards.
 6. Encourage the preservation and sensitive reuse of historic buildings, that need strengthening for protection from seismic hazards, in a manner that does not endanger public safety.
 7. Strengthen earthquake resistance standards for non-structural components, especially in critical facilities.

GEOLOGIC HAZARDS

Goal: Protect public safety and minimize the social and economic impacts from geologic hazards.

- Policies**
8. Review proposals and projects proposing new development and expansion of existing development in areas susceptible to landsliding, debris flow, and rockfalls, and in areas where collapsible or expansive soils are a significant problem; and disapprove projects which cannot mitigate these hazards to the satisfaction of responsible agencies.
 9. Continue to improve and enforce stringent slope investigation and design standards, and to apply innovative hazard mitigation and maintenance plans for development in hillside areas.
 10. Upgrade slope maintenance measures and improve emergency response capability in hillside areas.

FLOOD AND INUNDATION HAZARDS

Goal: Minimize injury, loss of life, property damage, and economic and social disruption caused by flood and inundation hazards.

- Policies**
11. Continue to review proposals and projects for expansion of existing development and construction of new facilities, especially critical facilities, within areas subject to floods and other high-risk inundation areas, and disapprove projects which cannot mitigate the hazards to the satisfaction of responsible agencies.
 12. Promote the use of flood plain management measures in high-risk inundation areas, and require expansion of existing and proposed new developments to be flood-proofed and secured to minimize future flood losses.
 13. Encourage improvement of the existing flood control system capacity to ensure that it is capable of protecting existing development from rising amounts of runoff produced by increased urbanization.
 14. Upgrade protection of the public from inundation hazards caused by structural failure and/or breaching of water storage tanks, debris basins, or dam and reservoir facilities.

WILDLAND AND URBAN FIRE HAZARDS

Goal: Reduce threats to public safety and protect property from wildland and urban fire hazards.

15. Maintain and strengthen the review of projects and development proposals; and upgrade County fire prevention standards and mitigation measures in areas of high wildland (mainly Fire Zone 4) and urban fire hazard.
16. Continue to coordinate fire fighting efforts with State, Federal and local agencies in fire hazard areas; and review and update mutual and automatic aid agreements between the County and other fire protection agencies.
17. Continue efforts to reduce all fire hazards, with special emphasis on reducing hazards associated with older buildings, multistory structures, and fire-prone industrial facilities; and maintain an adequate fire prevention capability in all areas.
18. Expand and improve vegetation management efforts in wildland fire hazard areas.
19. Promote improved watershed management practices to reduce the risk of damaging runoff and debris movement into urban areas.

HAZARDOUS MATERIALS

Goal: Reduce threats to the public health and safety from hazardous materials, especially threats induced by earthquakes.

- Policies**
20. Review proposed development projects involving the use or storage of hazardous materials, and disapprove proposals which cannot properly mitigate unacceptable threats to public health and safety to the satisfaction of responsible agencies.
 21. Promote the safe transportation of hazardous materials.
 22. Encourage businesses and organizations which store and use hazardous materials to improve management and transportation of such materials.

- 23. Promote efforts to reduce or eliminate the use of hazardous materials through dissemination of information about and creation of incentives and disincentives for use of safer substitutes.
- 24. Encourage improved, timely communications between businesses and emergency response agencies regarding hazardous materials/waste incidents.

EMERGENCY RESPONSE, PREPAREDNESS AND RECOVERY

Goal: Strengthen County short-term emergency response and long-term recovery capability.

- Policies**
- 25. Promote greater public awareness and understanding of safety hazards and emergency preparedness and response procedures.
 - 26. Promote the development of community/neighborhood, and workplace self-help and disaster relief groups to improve the effectiveness of local emergency response, light search and rescue, and emergency medical care.
 - 27. Strengthen the capability of County agencies to effectively respond to earthquake and non-earthquake induced emergencies.
 - 28. Upgrade regional heavy rescue capability including mobilization operations and resource management.
 - 29. Encourage critical facilities to maintain and regularly update emergency response plans identifying safety procedures, disaster control capabilities, and evacuation procedures such as drills and exercises.
 - 30. Upgrade interagency and multijurisdictional communications, planning and decision making to ensure efficient and integrated emergency response capability.
 - 31. Promote improved cooperation with nonprofit and private sector emergency response organizations.
 - 32. Establish an appropriate organization composed of County agencies and community representatives to develop adequate reconstruction policies and procedures in advance of a major emergency; and to effectively manage rebuilding and recovery operations after a major earthquake or other similar disaster.

33. Support Federal and State legislation to develop an adequate earthquake insurance program that includes hazard mitigation incentives.
34. Encourage the improvement of hazard prediction and early warning capability.
35. Strengthen emergency communication systems and improve cooperation between the media and emergency response agencies.

RESEARCH AND SAFETY INFORMATION SYSTEMS

- Goal:** Continue to promote research on and mapping of natural and urban hazards; and improve safety information systems for planning, emergency response management and hazard mitigation.
- Policies**
36. Support research programs to improve knowledge of seismic, geologic, fire, flood, and other hazards.
 37. Encourage research that will lead to the detailed mapping of ground response (microzonation) of Los Angeles County.
 38. Advocate early warning and disaster prediction research, and support application of the research results to emergency preparedness operations.

D. SAFETY ELEMENT ACTION PROGRAMS

SAFETY ELEMENT ACTION PROGRAMS

Introduction

The following pages identify the action programs designed to implement the policies of the Safety Element. Responsible agencies, which are those County organizations having roles in implementation of a given program, are listed for each action. Where more than one agency is listed, the first agency is the lead agency unless otherwise noted.

It is important to note that the action programs, singly or collectively, do not constitute a budget and are not a substitute for the regular County budgetary process. Budgeting specific actions will occur as resources are available, through the established budget process, involving the responsible agencies, the Chief Administrative Office, and the Board of Supervisors.

SEISMIC HAZARDS

Program 1 - Use Non-Urbanized Active Fault Zones for Low Intensity Purposes

Action 1.1

Where feasible, consider locating new low intensity public outdoor recreation areas and other public or private open space lands in active fault zones.

Responsible Agencies: Parks and Recreation, Regional Planning, Internal Services.

Action 1.2

In disposing of excess or tax delinquent public lands, consider exchanging unneeded County-owned lands located outside active fault zones for lands located within active fault zones; and consider retaining such lands located in active fault zones in permanent public ownership.

Responsible Agencies: Internal Services, County Counsel, Treasurer and Tax Collector.

Action 1.3

Investigate the feasibility of establishing a corporate, conservancy or other organization to acquire through fee simple, easement or other appropriate means of acquisition, lands for open space and outdoor recreation purposes in unurbanized segments of active fault zones. Consider transfer of County-owned and tax delinquent properties in active fault zones to the organization for use and management for outdoor recreation and open space purposes.

Responsible Agencies: Parks and Recreation, Internal Services, Regional Planning, County Counsel.

Action 1.4

Maintain existing or similar rural and open space zoning in nonurban segments of active fault zones.

Responsible Agency: Regional Planning.

Program 2 - Guide Development to Low Seismic Risk Areas

Action 2.1

Consider the inclusion of a Seismic-Geologic or Hazardous Area Overlay Zone in the Zoning Code providing for appropriate regulations, standards, site investigation requirements, risk mitigation measures; and covering earthquake-hazardous areas such as those listed below:

- a. State-designated active Alquist-Priolo Special Studies Zones (APSSZ);
- b. other active faults, as shown on Plate 1 (Fault Rupture Hazards and Historic Seismicity); and
- c. areas of liquefiable (L) alluvium, as shown on Plate 4 (Liquefaction Susceptibility).

In addition, consider amending the Zoning Code to provide for, if necessary, conditional use permits for construction of critical facilities in earthquake-hazardous areas. Review of proposals for critical facilities should ensure that seismic-geologic conditions have been adequately investigated, that hazard mitigation measures have been recommended to reduce risks to tolerable levels, that the health and safety of the occupants of the site, the adjoining property, and the general public are not endangered.

Responsible Agencies: Regional Planning, Public Works.

Action 2.2

Review discretionary projects for development or expansion of the following categories of critical facilities and disapprove or oppose projects which cannot mitigate hazardous conditions to the satisfaction of responsible agencies:

- a. Any lifeline system facility under County jurisdiction such as energy transmission systems, major utility facilities, evacuation and disaster routes, and structures storing heavy rescue and debris cleanup equipment;
- b. essential facilities that are needed in times of emergencies such as medical facilities, fire and police stations, emergency operations centers, and communication centers;
- c. high-risk facilities such as nuclear power plants, dams, and industrial plants which manufacture or store explosives, toxic materials, or petroleum products that, if damaged, could cause catastrophic effects far beyond the facilities themselves;
- d. high occupancy facilities having potential for catastrophic casualties and crowd control problems such as high rise buildings, large public and private assembly facilities and large multifamily residential complexes (greater than 500 person capacity);
- e. dependent care facilities that house populations with special evacuation considerations, such as educational facilities for preschools and public and private schools, rehabilitation centers, prisons, and major social care facilities including group care homes and elderly care facilities;
- f. economic facilities whose continued operation is paramount to avoiding severe economic impact such as banking, vital record keeping and archiving activities, computing and data processing centers, airport and port facilities, and large industrial/commercial complexes.

Encourage relocation, retrofitting or strengthening of existing substandard facilities in hazardous areas; and use of innovative concepts such as transfer of development rights and development clustering for new projects.

Responsible Agencies: Regional Planning, Public Works, Forester and Fire Warden.

Action 2.3

Continue to enforce the existing County Building Code requirements (Section 311, Title 26), pertaining to APSSZ, to include all active faults, including those not designated within the APSSZ. Perform a regular review of compiled fault investigations to determine the adequacy of active and potentially active fault designations.

Responsible Agencies: Regional Planning, Public Works.

Action 2.4

Consider using California Environmental Quality Act (CEQA) procedures, impact mitigation fees, tax incentives and disincentives, and other measures to direct inappropriate development away from earthquake-hazardous areas; and encourage incorporation of adequate risk mitigation measures during design of projects.

Responsible Agencies: Regional Planning, Public Works, Assessor.

Action 2.5

Investigate the feasibility of requiring that the real estate commissioner's hazard disclosure statements be expanded to include any hazard mitigation measures required as a condition of project approval.

Responsible Agencies: Public Works, Regional Planning, Recorder.

Program 3 - Ensure Safe Development

Action 3.1

Continue to encourage submittal of geologic information by certified engineering geologists and seismic information by qualified registered geologists and geophysicists, for any discretionary project or development proposal in an earthquake-hazardous area. The reports are to be prepared in accordance with State Guidelines or stricter standards for any discretionary project or development proposal subject to earthquake induced hazards. Seismic-geologic reports prepared for other projects in the vicinity of a given project may be utilized, at the discretion of the responsible agency, to supplement or in lieu of a new report.

Responsible Agency: Public Works.

Action 3.2

Consider amending the Building Code or the Building Code Manual to:

- a. Exclude definite trenching depths (refer to Section 311) and require subsurface investigation to the base of Holocene materials or to the satisfaction of the responsible agency. Adequate setbacks for faults, discovered to be active, should be based on the recommendations of the geological consultant. The Building Code Manual should be revised to include definite procedures and methods that are acceptable for locating active fault zones in compliance with Section 311 of the Building Code. This manual must be available to the public and note responsible parties for approving specific exploration programs;
- b. Provide for liquefaction studies that identify those soils that have the potential for public endangerment and recommend possible mitigation measures to the satisfaction of the responsible agency for construction of critical facilities and large structures involving engineering design in areas known to have a potential to endanger the public by liquefying based on the latest maps and the available subsurface data. It must be recognized that liquefaction can occur at depths to 50 feet. Establish and maintain procedures for determining when site specific liquefaction studies are necessary; and

- c. Improve construction standards and mitigation measures for critical facilities and structures designed for human occupancy in areas of potential liquefaction; and consider requiring special investigation of development site seismic response conditions for critical facilities in alluvial areas.

Responsible Agency: Public Works.

Action 3.3

Encourage updating of the Uniform Building Code (UBC) to incorporate the most current seismic design standards and hazard reduction measures from the Applied Technology Council (ATC), the Structural Engineers Association of California (SEAOC) and the Earthquake Engineering Research Institute (EERI). The Uniform Building Code is the model code which is adopted by the State Building Standards Commission; and the County is required to at least meet or exceed its requirements. Consider amending the Building Code to provide for the following:

- . Construction of new tilt-up buildings in simple configurations or other designs which minimize structural and nonstructural earthquake damage;
- . application of lateral shear values to both new and modified existing construction; and
- . site specific, probabilistic dynamic analyses for buildings greater than 5 stories or 65 feet in height; or structures with stiffness, weight, or geometical irregularities.

The County should impose more stringent requirements, if justified by State law, based on geography, topography or climate.

Responsible Agency: Public Works.

Action 3.4

Continue to improve seismic structural design standards for critical facilities and strengthen Building Code standards to ensure improved ground shaking response by other buildings and structures; and consider requiring improved construction standards and mitigation measures for development projects in areas of high ground shaking response, as identified in the 1975 Seismic Safety Element, other sources such as the California Division of Mines and Geology Earthquake Scenario reports, and in future reliable seismic shaking maps or ground response microzonation data bases.

Responsible Agencies: Public Works, Regional Planning.

Program 4 - Protect Lifelines

Action 4.1

When new technologies are developed, encourage responsible agencies, such as the State Public Utilities Commission (PUC), the Building Standards Commission, the Federal Housing Administration, the Federal Emergency Management Agency, and the State Architect to adopt or approve improved seismic design, construction and maintenance standards for utility and other lifeline systems traversing earthquake-hazardous areas; and to require adequate risk mitigation measures at the site or alignment level to protect critical lifeline systems such as water, sewer, natural gas, electrical, and communication utilities. Appropriate measures may include system segmentation, easy lifeline access, quick repair capability, emergency shut-off, and emergency backup systems or arrangements.

Responsible Agencies: Public Works, Internal Services.

Action 4.2

Continue to review proposals for major utility facilities (such as major new pipelines, power transmission lines), expressways, arterial highways, bridges, tunnels, transit lines, evacuation routes and other critical lifelines under County jurisdiction that would require discretionary permits or actions to ensure that they either incorporate mitigation measures and safety features, or avoid, where feasible, active or potentially active faults and zones of potential liquefaction; and that their exposure to earthquake-induced slope failure or earthquake-induced inundation is minimized.

Responsible Agencies: Public Works, Regional Planning.

Action 4.3

Identify vulnerable critical lifelines in high-risk areas, and encourage both the operating organizations and the responsible regulatory agencies to support retrofit programs and/or stockpiling of replacement components in areas most susceptible to damage.

Responsible Agencies: Regional Planning, Public Works, Internal Services.

Program 5 - Strengthen Critical Facilities and Retrofit or Replace Potentially Hazardous Buildings and Structures

Action 5.1

Complete a structural assessment and maintain a phased hazard abatement program for all inventoried County-owned and leased buildings in the Internal Services Department data base.

Responsible Agencies: Internal Services, Public Works.

Action 5.2

Consider developing and using a building screening methodology modeled after advanced programs such as the Japanese National Land Program procedure, using technical information from SEAOC and EERI for the inventory, structural evaluation, and assessment of risk to County-owned or operated buildings, and critical facilities within unincorporated County areas.

Responsible Agencies: Public Works, Internal Services.

Action 5.3

Encourage the inventory of the following potentially hazardous buildings; and establish priorities for their safe management, rehabilitation, and/or replacement:

- a. Unreinforced masonry (URM) buildings, including those with URM wall infilling;
- b. nonductile concrete frame buildings;
- c. inadequately designed pre-cast tilt-up construction;
- d. multistory buildings with soft stories;
- e. inadequately designed structures with geometrical irregularities including long spans and irregular shapes;
- f. mobile homes and residential buildings not properly secured to their foundations;
- g. dilapidated buildings; and
- h. buildings with unusual interior and exterior nonstructural hazards.

Complete the existing program for abatement of seismic hazards in unreinforced masonry buildings.

Responsible Agencies: Public Works, Regional Planning, Internal Services.

Action 5.4

Improve the effectiveness of programs to abate threats to public safety from potentially hazardous buildings through rehabilitation, replacement, occupancy management and facility emergency response planning. Establish priorities and a phased abatement program to minimize negative consequences such as displacement of residents and businesses located in hazardous buildings by:

- a. Considering the provision of relocation assistance benefits to persons or businesses displaced as a result of the rehabilitation or replacement of potentially hazardous buildings.
- b. Studying the feasibility of setting up a County-administered revolving loan program to assist unincorporated area property owners whose properties are identified as hazardous and need improvements or have to be demolished; and
- c. Encouraging the use of manpower development programs, small business loans, and earthquake safety and housing rehabilitation bonds to mitigate the negative economic and financial impacts of reducing risks in potentially hazardous structures.

Responsible Agencies: Community Development Commission, Regional Planning, Public Works, Chief Administrative Office, Housing Authority, Senior Citizens Affairs.

Action 5.5

Advocate an active program for identification and reinforcement of potentially hazardous buildings in cities contracting with the County for emergency services; and continue to recommend changes to State, Federal, and local government urban redevelopment programs to provide for the phased abatement of fire and earthquake-hazardous old buildings.

Responsible Agencies: Public Works, Forester and Fire Warden, Regional Planning, Community Development Commission.

Action 5.6

Encourage the retrofitting and strengthening of all bridge, roadway structures, expressways, dams and reservoirs. Give priority to those with identified substandard design features.

Responsible Agency: Public Works.

Program 6 - Protect Seismically Threatened Historic Buildings

Action 6.1

Support the improvement and facilitate the use of the State Historic Building Code as a means of encouraging the protection and preservation of buildings and structures having historic value from demolition or incompatible alteration due to application of hazard abatement programs.

Responsible Agencies: Public Works, Regional Planning, Chief Administrative Office.

Program 7 - Mitigate Nonstructural Hazards

Action 7.1

Continue to update and modify County Building Code standards to require increased bracing and seismic resistance of nonstructural components, with special emphasis on components in medium and high-rise buildings, and critical facilities.

Responsible Agencies: Public Works, Internal Services.

Action 7.2

Encourage private sector programs for voluntary mitigation of exterior and interior nonstructural hazards for medium and high-rise buildings, industrial structures, and privately-owned critical facilities. Encourage the establishment of financial incentives designed to foster mitigation of these hazards.

Responsible Agency: Public Works.

GEOLOGIC HAZARDS

Program 8 - Guide Development to Low Geologic Risk Areas

Action 8.1

Continue to improve and apply Los Angeles County hillside management guidelines and standards to all slopes greater than 25 percent; and encourage the use of cluster and planned unit developments for projects in or near geologically hazardous areas.

Responsible Agencies: Regional Planning, Public Works.

Program 9 - Improve and Enforce Slope Investigation and Hillside Design Standards

Action 9.1

Continue to enforce, monitor, and improve hillside development standards which place responsibility on the developer, with advice from qualified engineers and geologists, to develop and implement adequate mitigation measures as conditions of project approval. Project review should ensure the following:

- a. mitigation measures which address protection of public safety and property both inside and outside the project boundaries;
- b. identification and adequate mitigation of adverse slope conditions including potential earthquake and moisture-induced slope instability;
- c. provisions for hazard mitigation or avoidance of areas subject to rapid slope failures, which allow the County to designate adequate setbacks and clearances;
- d. adequate channel design and building pad elevation to remove development from the projected path of rapid slope failures;
- e. adequate investigation of the potential for liquefaction-induced lateral spreading and other slope failures; including projects with slopes of less than 25 percent located in liquefiable areas (Plate 4), or in unstable Hs and Qs units (Plate 2);
- f. provision for proper site planning, design criteria, and cross-sections exceeding or in compliance with Building Code standards pertaining to hillside grading practices; and
- g. slope design in landslide prone areas that considers the potential effects of high rainfall, private sewage systems, landscaping irrigation and possible runoff from adjacent future development.

Provide adequate mitigation measures for projects in slopes of less than 25 percent where conditions on or near a project site constitute significant geologic hazards.

Responsible Agencies: Public Works, Regional Planning.

Action 9.2

Consider amending the Building Code to prohibit construction of fill slopes steeper than 2:1 without structural reinforcement. Allow steeper slopes where it can be demonstrated to the satisfaction of the responsible agency that steeper fill slopes can be designed safely. Continue to apply existing policy for slope stability analysis of cut and fill slopes equal to or steeper than 2:1, including:

- a. 1.1 pseudostatic minimum Factor of Safety for the seismic design of slopes;
- b. 1.5 static minimum Factor of Safety for the nonseismic design of slopes.

Responsible Agency: Public Works.

Action 9.3

Study and develop improved seismic and slope stability analyses, including the feasibility of using the American Society of Civil Engineers (ASCE) permanent seismic deformation method for the construction of critical facilities near active faults (Plate 1) and in areas of high shaking intensity. Recommend amendments to the Building Code, as needed, addressing both seismic and static methods.

Responsible Agency: Public Works.

Action 9.4

Continue to require developers to provide multiple access to proposed developments; and, where feasible, equip access routes with rock nets, fences, retaining barriers or other features designed to prevent road blockage. Where feasible, consider rerouting roads threatened by major landslides.

Responsible Agencies: Public Works, Regional Planning.

Action 9.5

Improve the existing mud and debris flow mitigation programs by obtaining input from interdisciplinary teams including hydrogeologists, sedimentologists, geologists and geotechnical engineers; and through cooperation with the Federal Emergency Management Agency.

Responsible Agency: Public Works.

Program 10 - Improve Slope Maintenance Measures

Action 10.1

Improve the proper treatment of graded slopes to minimize erosion and slope failure hazards to property owners, residents and the public.

Responsible Agency: Public Works.

Action 10.2

Study the feasibility of utilizing Geologic Hazard Abatement District (GHAD) authority for the following:

- a. Ground water and slope monitoring instrumentation, and regulation of the amount of water infiltration into hillside areas from septic systems, landscape irrigation, swimming pools and other sources;
- b. slope mitigation measures that control erosion or require unusual stabilization and grading;
- c. landslide dewatering to prevent reactivation of inactive landslides or acceleration of existing active landslides; and
- d. provision and maintenance of flood control facilities in areas susceptible to mud and debris flows.

Responsible Agencies: Public Works, Regional Planning.

Action 10.3

Continue to inform homeowners of potential mud and debris flow hazards below burnt watersheds and advise them of protective measures; and continue to identify high-risk areas and predict high-risk time periods based on factors such as weather conditions and locations of burnt watersheds.

Responsible Agencies: Public Works, Forester and Fire Warden.

Action 10.4

Monitor and improve as necessary the effectiveness of County Storm Operations Center heavy equipment teams to perform debris basin cleanouts and other emergency operations as soon as feasible after heavy storm flows.

Responsible Agencies: Public Works, Forester and Fire Warden.

FLOOD AND INUNDATION HAZARDS

Program 11 - Discourage High-Risk Development

Action 11.1

Continue to review development proposals and to enforce existing flood control, subdivision, and zoning standards in unregulated flood plains recognized by the County and the Federal Emergency Management Agency (FEMA) National Flood Insurance Program. Consider expanding these requirements to "high-risk" dam inundation or tsunami inundation areas. Continue to restrict development of inappropriate structures in County defined and FEMA defined flood plains and consider extending such restrictions to other high-risk inundation areas that may be defined in the future. Encourage improved flood plain management in all areas of the County in connection with new development.

Responsible Agencies: Public Works, Regional Planning.

Action 11.2

Identify potential high-risk inundation areas for dams, debris basins, and water storage tanks; and manage them to reduce risks.

Responsible Agencies: Public Works, Regional Planning.

Program 12 - Minimize Flood Hazards

Action 12.1

Proposals for large subdivisions and critical facilities, to be located in potential high-risk dam and tsunami inundation areas, should assess the risk of inundation and provide adequate flood mitigation measures as conditions of project approval.

Responsible Agency: Public Works.

Action 12.2

Amend building, fire, electrical, plumbing and mechanical code design and construction standards to ensure that the threat of fire hazard and hazardous material releases is adequately mitigated in flood areas, high-risk dam inundation areas, and tsunami inundation areas, including provisions that require the following:

- a. Where feasible, flammable and hazardous materials/waste should be stored in anchored watertight containers or storage tanks, and be protected from impact by debris contained in flood torrents;

- b. fuel lines and electrical ignition sources (such as fuse boxes) should be protected from impact by flood debris; and
- c. construction materials should be fire-resistive consistent with the County Building Code.

Responsible Agencies: Public Works, Beaches and Harbors, Regional Planning.

Action 12.3

Review design and construction practices in tsunami inundation areas under County jurisdiction to ensure that building configuration, barrier and buffer zones, and nonstructural anchoring are adequate to prevent boats, piers, and vehicles from becoming damaging flood debris; and are designed to decrease the impact of tsunami wave torrents.

Responsible Agencies: Public Works, Beaches and Harbors.

Program 13 - Ensure Adequate Flood Control System Capacity

Action 13.1

Continue to monitor the effectiveness of flood control projects under County jurisdiction to ensure that increased runoff caused by expanding and intensifying urbanization is within flood control capacity. Improve maintenance, repair or modification of dams, flood channels, debris basins, culverts, and storm drainage systems.

Responsible Agencies: Public Works, Regional Planning.

Action 13.2

Cooperate with the Corps of Engineers in evaluating the postulated limits of major flood events, based on changing conditions, in the coastal and valley lowlands of Los Angeles County. Cooperatively plan and implement measures to respond to changing conditions; and evaluate the feasibility of mechanisms for financing flood control improvements designed to respond to changing conditions.

Responsible Agencies: Public Works, Regional Planning.

Program 14 - Public Safety and Dam Inundation

Action 14.1

Continue efforts to reduce risks associated with existing earth fill dams with emphasis on dams of substandard designs or those required to operate at reduced capacity. Retrofit or replace water storage tanks that do not meet established seismic design standards.

Responsible Agency: Public Works

Action 14.2

Advocate revision of state legislation to require dam inundation risk analyses and development of mitigation measures to protect development in "high-risk inundation" areas.

Responsible Agencies: Public Works, Regional Planning.

Action 14.3

Continue to coordinate regular inspection of large water tanks, debris basins, and reservoirs with the California Division of Safety of Dams Program to ensure their structural integrity; and consider additional structural or nonstructural inundation management if the potential risk justifies such action.

Responsible Agency: Public Works.

WILDLAND AND URBAN FIRE HAZARDS

Program 15 - Strengthen Project Review and Enforcement of Standards

Action 15.1

Continue to review all development projects proposed in Fire Zone 4 for availability of adequate emergency access and water supply for fire fighting purposes. Improve the enforcement of the Water Code, including provision for periodic inspection of water utilities to verify compliance with code requirements.

Responsible Agencies: Forester and Fire Warden, Public Works, Regional Planning.

Action 15.2

Continue to upgrade the Building, Fire, Subdivision and Zoning Codes to require onsite preventative measures, including adequate fire flows, fire breaks, fire resistant landscaping, fire retardant

construction, and automatic sprinkler systems to assist in fire suppression in fire hazardous areas, critical facilities, multistory and high occupancy buildings. Consider amending appropriate codes and ordinances to require that gas-fired and other water heaters be firmly anchored and immobilized.

Responsible Agencies: Regional Planning, Public Works, Forester and Fire Warden.

Action 15.3

Continue to require property owners to undertake fuel load management practices such as brush clearance, erosion control, slope stabilization and flammable rubbish removal. Also, continue to review development projects to ensure proper brush clearance, adequate requirements for emergency ingress and egress, and adequate fire flows for fire suppression.

Responsible Agencies: Forester and Fire Warden, Regional Planning, Public Works, Agricultural Commissioner.

Action 15.4

Explore the feasibility of requiring applicants for development projects to participate in financing the cost of fire protection (fire stations and other capital improvements).

Responsible Agencies: Regional Planning, Chief Administrative Office, Forester and Fire Warden.

Program 16 - Coordinate and Improve Mutual Aid Agreements

Action 16.1

Continue to participate in and improve mutual aid agreements with the United States Forest Service, the California Division of Forestry, and other County and city fire fighting agencies.

Responsible Agency: Forester and Fire Warden.

Program 17 - Reduce Fire Hazards in Existing Development

Action 17.1

Improve long-range fire prevention capability by encouraging increased use of sprinklers and fire-retardant construction materials. Consider amending the Building and Fire Codes to require the installation of sprinkler systems in existing critical facilities, especially high-risk multistory and high occupancy facilities. Implementation priority should be phased depending on

the age, occupancy, materials used in construction, and the location of buildings. Relocation benefits should be provided where appropriate.

Responsible Agencies: Public Works, Forester and Fire Warden, Internal Services, Regional Planning.

Action 17.2

Continue to evaluate fire hazardous buildings and establish measures to reduce risk to tolerable levels through improved fire prevention capacity, renovation, demolition, or occupancy reduction. The occupancy, value, age, and historic value of the building; and the social and economic characteristics of the occupants should be considered in phasing implementation priorities to minimize negative impacts.

Responsible Agencies: Forester and Fire Warden, Public Works.

Program 18 - Reduce Wildland Fire Hazards

Action 18.1

Improve wildland fire hazards assessment and rating to establish priority areas for the reduction of fire hazard to tolerable levels. Give consideration to such factors as vegetation type, slope, aspect, and proximity to development; expand vegetation management activities to reduce fuel loading of highly flammable vegetation; and manage prescribed burns to ensure that development downslope is not impacted by increased erosion and debris flows and that air pollution is minimized.

Responsible Agencies: Forester and Fire Warden, Public Works.

Program 19 - Watershed Management

Action 19.1

Continue to improve watershed management efforts in coordination with Federal, State, and local agencies to reduce the frequency, size and intensity of wildland fires and their related watershed damage. This includes the maintenance of fire and fuel breaks, the review of wildland fire events for potential erosion impacts, and the provision of emergency revegetation where appropriate.

Responsible Agencies: Forester and Fire Warden, Public Works.

HAZARDOUS MATERIALS AND WASTE HAZARDS

Program 20 - Promote Safe Use and Storage

Action 20.1

Review projects proposing to use or store hazardous materials and wastes; and require compliance with mitigation measures (including adherence to an onsite hazardous materials management plan) to ensure the protection of public safety from accidental releases. Encourage avoidance of earthquake hazardous or high-risk inundation areas, unless adequate mitigation measures can be instituted.

Responsible Agencies: Regional Planning, Health Services, Forester and Fire Warden.

Program 21 - Promote Safe Transportation

Action 21.1

Encourage responsible Federal and State agencies to improve hazardous materials transportation safety measures through more effective regulation and enforcement actions.

Responsible Agencies: Sheriff, Forester and Fire Warden.

Program 22 - Improve Onsite Management

Action 22.1

Consider requiring the preparation and implementation of individual business risk management (emergency response) plans, as a condition of project approval, to ensure the following:

- a. Preparation and maintenance of a hazardous materials inventory, identifying permitted quantities of hazardous or volatile materials; a site plan showing onsite hazardous materials storage; and an inventory of onsite emergency equipment adequate for emergency response.
- b. implementation of environmental audits for tracking hazardous materials during and after use; and plans for inspection, monitoring and record keeping to verify control efforts;
- c. provision for treatment or control of all unauthorized emissions, discharges, or releases through the best available technology, and changes in processing and manufacturing strategies. Encourage mutual aid and contract cities to promote improved onsite management of hazardous materials;

- e. strengthening of potentially hazardous structures which house hazardous materials; and
- f. training of personnel to safely manage and use hazardous materials/wastes.

Responsible Agencies: Forester and Fire Warden, County Counsel, Health Services, Sanitation Districts, Public Works.

Program 23 - Reduce Public Exposure to Hazardous Materials/Wastes

Action 23.1

Develop and disseminate technical information to inform hazardous waste generators of opportunities for:

- a. Source reduction through replacing hazardous materials with less hazardous or nonhazardous materials, and through good housekeeping activities and process modifications that reduce or eliminate the use of hazardous materials;
- b. recycling through reclamation or reuse of hazardous waste; and
- c. safe treatment and disposal practices.

Responsible Agencies: Sanitation Districts, Forester and Fire Warden, Public Works, Health Services.

Action 23.2

Continue to participate in cooperative hazardous materials planning and management efforts, such as the Southern California Hazardous Waste Management Authority, which promote the concept that regional solutions are required to handle waste treatment and disposal, and that each jurisdiction should accept responsibility for management of hazardous wastes in an amount proportional to the wastes generated by that jurisdiction.

Responsible Agencies: Sanitation Districts, Forester and Fire Warden, Public Works, Health Services.

Action 23.3

Explore the feasibility of providing financial incentives for the prudent management of hazardous wastes including support of State and Federal tax incentives and fees, such as impact mitigation fees on hazardous materials.

Responsible Agencies: Chief Administrative Office, Sanitation Districts, Public Works.

Action 23.4

Improve the capability to respond to hazardous material releases by improving the training and equipment of "hazmat teams", and deploying them in areas with a high potential for releases such as major concentrations of petrochemical industries. Improve the hazardous materials abatement training of all emergency response personnel; and investigate the need for and feasibility of expanding the number of hazmat teams.

Responsible Agencies: Forester and Fire Warden, Public Works, Health Services.

Program 24 - Improve Hazardous Incident Communications

Action 24.1

Establish preplanned communication procedures for reporting hazardous materials/waste incidents to the appropriate response agencies.

Responsible Agencies: Forester and Fire Warden, Health Services, Sheriff, Public Works.

EMERGENCY RESPONSE, PREPAREDNESS AND RECOVERY

Program 25 - Promote Greater Public Awareness

Action 25.1

Promote greater public awareness by:

- a. Supporting the addition and maintenance of a mandatory hazards education program to the public school curricula;
- b. continuing to encourage the maintenance and improvement of education and awareness information developed and distributed by public service organizations such as the Red Cross and the Southern California Earthquake Preparedness Project.
- c. maintaining and improving the current fire, earthquake safety and hazardous materials education programs of the Forester and Fire Warden and other responsible agencies;
- d. continuing to update public information pamphlets about geological and seismic factors for property owners and prospective buyers, the types of information on file at the

Department of Public Works, and additional potential sources of information from other appropriate agencies; and

- e. developing and disseminating maps, pamphlets, and additional sources of information on regional hazards; and exploring the feasibility of requiring lenders, insurers, developers, and real estate sales personnel to distribute this information to prospective buyers.

Responsible (Co-Lead) Agencies: Regional Planning, Public Works, Forester and Fire Warden, County Office of Education, Sheriff, Chief Administrative Office.

Action 25.2

Consider establishment of a County awards program to recognize individuals, organizations, agencies and jurisdictions which make significant contributions to improving public safety in Los Angeles County.

Responsible Agencies: Chief Administrative Office, Regional Planning, Public Works, Forester and Fire Warden, Sheriff.

Program 26 - Strengthen Community and Workplace Self-Help Capability

Action 26.1

Encourage the establishment of a County-wide network of community and neighborhood self-help groups, using existing associations such as homeowner groups, and neighborhood watch programs; or through creation of new organizations, serving as auxiliaries to public and nonprofit emergency response organizations, responsible for such actions as evacuation, light rescue, first aid care, fire fighting, traffic direction, and utility shut-off activities. Work with these groups to improve disaster preparedness in residential areas and local dependent care facilities. In addition, encourage development of improved disaster response capacity in workplaces including abatement of nonstructural hazards, preparedness planning and exercises, information dissemination, improved communications capacity and stockpiling of emergency supplies and equipment.

Responsible Agencies: Chief Administrative Office, Internal Services, Forester and Fire Warden, Sheriff, Probation.

Program 27 - Strengthen County Disaster Planning and Readiness

Action 27.1

Identify emergency response objectives and develop contingency plans and hazard-reduction programs to mitigate potential hazards emphasizing the following priorities:

- a. Critical facilities and hazardous buildings with special heavy rescue, fire-suppression, medical or evacuation requirements, including unreinforced masonry and multistory buildings, hospitals, and jails;
- b. vulnerable emergency lifeline systems and facilities whose failure could impair emergency response capability including high pressure water lines, communication centers, electrical substations;
- c. access routes vulnerable to blockage from unstable slopes, ground failure, failed bridges, and freeway overpasses, non structural collapses, and flood and inundation debris, especially routes to essential, dependent care facilities, County heavy equipment/maintenance facilities, hospitals, and fire stations;
- d. railroad tracks vulnerable to ground rupture, and the surrounding development at risk from train derailment; and
- e. emergency housing for displaced persons with emphasis on housing for low income persons.

Responsible Agencies: Chief Administrative Office, Public Works, Forester and Fire Warden, Public Social Services, Health Services, Community Development Commission, Sheriff.

Action 27.2

Designate, in cooperation with the Red Cross, a County-wide system of reception centers and community disaster staging and mass care centers including schools, parks, and other appropriate facilities. Where appropriate, these centers should be used to mobilize and deploy volunteers. Strengthen the capability of emergency response agencies to effectively mobilize and deploy large numbers of volunteers.

Responsible Agencies: Sheriff (lead agency for clearinghouse functions), Public Social Services (lead agency for reception centers), Forester and Fire Warden, , Public Works, Chief Administrative Office, Parks and Recreation, Internal Services, Sanitation Districts, Senior Citizens Services.

Action 27.3

Continue to improve building emergency coordinator training in all County departments and assure that departments develop an adequate redundancy of trained personnel. Improve emergency and relief services by identifying County staff and volunteers who are fluent in nonEnglish languages and capable of conducting multilanguage disaster preparedness, response, and recovery education programs for ethnic populations and nonEnglish speakers.

Responsible Agencies: Chief Administrative Office, Human Resources Commission, Community and Senior Citizens Services.

Action 27.4

Continue to implement and regularly update the County's Five-Year Plan for Earthquake Preparedness and other related plans, such as the Multi-Hazard Functional Plan.

Responsible Agencies: Chief Administrative Office, Public Works, Forester and Fire Warden, Sheriff, Internal Services, Health Services, Public Social Services.

Action 27.5

Maintain and improve the effectiveness of the current network of County emergency operations centers.

Responsible Agencies: Chief Administrative Office, Sheriff.

Action 27.6

Improve the capacity of County agencies to control disorder, looting, and crime associated with major disasters.

Responsible Agency: Sheriff.

Program 28 - Establish Emergency Response and Urban Heavy Rescue Bases

Action 28.1

Evaluate the feasibility of establishing major subregional bases as operations centers for marshalling trained personnel, equipment, and other resources for major urban heavy rescue operations. Ensure that all bases are equipped for helicopter operations. In addition, review and improve County emergency response and urban heavy rescue contracts and/or agreements with Federal agencies (including military agencies), businesses, and organized labor, making provision for adequate planning, resources and compensation.

Responsible Agencies: Forester and Fire Warden, Public Works, Chief Administrative Office, Sheriff.

Program 29 - Encourage Critical Facility Emergency Planning

Action 29.1

Promote the preparation and implementation of emergency response plans by facilities using/or storing hazardous materials; and review the existing risk management response plans of hazardous materials facilities on a regular basis for potential improvements in contingency planning, including onsite firefighting capability, multijurisdictional communication, and emergency evacuation procedures involving coordination with emergency organizations and community self-help groups.

Responsible Agencies: Forester and Fire Warden, Chief Administrative Office, Sheriff.

Action 29.2

Consider requiring projects for development of critical facilities in hazardous areas to prepare and maintain emergency response plans as a condition of project approval. The plans should address relevant hazards and identify appropriate emergency actions and procedures. Encourage critical facilities to be equipped with emergency backup generators or other sources of emergency power.

Responsible Agencies: Regional Planning, Public Works, Forester and Fire Warden, Sheriff, Internal Services, Health Services-Hospitals.

Action 29.3

Encourage existing critical facilities in high-risk dam inundation areas to develop and maintain contingency plans for efficient shutdown, response and evacuation in the event of reservoir damage.

Responsible Agencies: Public Works, Forester and Fire Warden, Sheriff.

Action 29.4

Support efforts by the Business and Industry Council for Emergency Planning and Preparedness to provide computer system backup and shutdown procedures for banking, utility, and other key public and private facilities.

Responsible Agency: Chief Administrative Office.

Program 30 - Improve Interagency and Interjurisdictional Cooperation

Action 30.1

Prepare and/or improve mutual aid plans and joint operating procedures involving the following operations:

- a. Law enforcement;
- b. fire protection and heavy rescue;
- c. care and shelter;
- d. emergency medical and public health including mental health services;
- e. construction and engineering;
- f. emergency operations management; and
- g. other appropriate operations.

Responsible Agencies: Chief Administrative Office, Public Works, Forester and Fire Warden, Health Services, Public Social Services, Sheriff, Probation.

Action 30.2

Continue to participate in joint exercises with cities to improve interjurisdictional communication, collective decision making for coordinated emergency response; and designate an evaluation team to monitor the effectiveness of interagency and multijurisdictional coordination. Improve multijurisdictional earthquake emergency plans, exercises and drills for response to earthquakes, tsunamis, seiches and dam failures.

Responsible Agencies: Chief Administrative Office, Forester and Fire Warden, Sheriff, Public Works, Emergency Preparedness Commission for the County and Cities of Los Angeles Beaches and Harbors.

Action 30.3

Advocate active participation by the County, the cities of Los Angeles County, and adjacent County jurisdictions in the International Decade of Natural Hazard Reduction to facilitate the exchange and mutual use of hazard management technologies, programs and other pertinent information.

Responsible Agencies: Emergency Preparedness Commission for the County and Cities of Los Angeles, Chief Administrative Office.

Action 30.4

Continue to improve the efficiency of emergency communication systems, including the Emergency Broadcasting System and multijurisdictional fire and law enforcement emergency radio systems. Develop improved emergency communication capabilities among jurisdictions.

Responsible Agencies: Sheriff, Forester and Fire Warden, Public Works, Internal Services, Chief Administrative Office.

Program 31 - Nonprofit and Private Sector Cooperation

Action 31.1

Evaluate the feasibility of contracting with private sector organizations for provision of emergency response and recovery services.

Responsible Agencies: Chief Administrative Office, Sheriff, Forester and Fire Warden, Public Works, Internal Services.

Program 32 - Earthquake Reconstruction Recovery

Action 32.1

Consider establishing a reconstruction authority composed of members of various County departments and the community, and define the roles it will play in developing contingency plans and programs; and managing post-disaster rebuilding and recovery.

Responsible Agencies: Chief Administrative Office, Public Works, Community Development/Housing Activity, Internal Services, Senior Citizens Services, Regional Planning, Public Social Services.

Program 33 - Earthquake Insurance and Hazard Reduction

Action 33.1

Encourage Federal and State legislation for improved earthquake insurance services; and advocate legislation for changes in insurance rate structuring to encourage private industries, such as utilities and owners of critical facilities, to accelerate hazard reduction efforts.

Responsible Agency: Chief Administrative Office.

Program 34 - Improved Hazard Prediction and Warning

Action 34.1

Cooperate with State and Federal agencies to improve the reliability of hazard prediction and effectiveness of disaster warning procedures.

Responsible Agencies: Public Works, Regional Planning, Chief Administrative Office, Sheriff.

Program 35 - Emergency Communications

Action 35.1

Continue to improve and integrate the communication systems of public and private emergency response organizations and agencies in Los Angeles County and the surrounding region. Promote the continued development of redundant or backup communications capacity. In addition, improve coordination between public emergency response agencies and the communications media; and improve the training and procedures of emergency response agencies for coordinating with the communications media.

Responsible Agencies: Sheriff, Chief Administrative Office, Forester and Fire Warden, Public Works, Internal Services, Health Services.

RESEARCH AND SAFETY INFORMATION SYSTEMS

Program 36 - Improve Knowledge of Natural and Urban Hazards

Action 36.1

Advocate the expansion of the research and hazard management activities supported by the National Earthquake Hazard Reduction Act (NEHRP) and the California Hazard Reduction Act in Los Angeles County.

Responsible Agency: Public Works.

Action 36.2

Advocate and consider participation in accelerated seismic and geologic research and mapping programs by the U.S. Geological Survey and the California Division of Mines and Geology. Maps should be produced in a variety of appropriate scales (including 1:24,000) with priority given to mapping in alluvial and hillside areas projected to experience rapid urban expansion. High priority mapping programs should include:

- a. Basic geologic mapping for engineering applications (covering geologic structure, faulting and rock types);
- b. landslide and debris flow inventory and susceptibility mapping, and projected mud debris flow inundation mapping, giving priority to mapping at the interface between urban development and open and rural unincorporated hillside areas;
- c. improved predictive mapping of ground motion, ground failure and liquefaction;
- d. earthquake recurrence intervals on active faults; and
- e. basic research on buried faults, including surface rupture potential; and
- f. collapsible and expansive soils.

Responsible Agency: Public Works.

Action 36.3

Encourage the establishment and maintenance of cooperative mapping programs involving the United States Geological Survey, the California Division of Mines and Geology, private industry,

academia, the Southern California Association of Governments (SCAG), and other interested Federal, State, and local agencies.

Responsible Agencies: Chief Administrative Office, Public Works, Regional Planning.

Action 36.4

Encourage the maintenance and expansion of the U.S. Geological Survey seismic and geologic mapping program which produces reports and maps at a variety of scales including the 1:100,000 scale; and encourage the publication of the manuscript geologic research and mapping available from the Dibblee Foundation.

Responsible Agency: Public Works.

Action 36.5

Participate in the wildland vegetation research activities of the United States Forest Service, California Department of Forestry and other involved research agencies; and support improved wildland fire hazard mapping in the unincorporated areas and provide for computerization of the data for research and planning purposes.

Responsible Agency: Forester and Fire Warden.

Action 36.6

Continue and expand research efforts which address factors that may influence flooding and wildland fire hazards. This should include research on the greenhouse effect which may influence precipitation patterns, drought and sea level fluctuations. Encourage continuation of public and private research on fire prevention and suppression including the development of fireproof or fire resistant materials.

Responsible Agencies: Forester and Fire Warden, Public Works.

Program 37 - Microzonation Research

Action 37.1

Support improved subsurface mapping of alluvial basin deposits in the unincorporated County and computerization of the data including the compilation of existing borehole and engineering geologic report information, including:

- a. establishment of the thickness of Holocene units identified on Plate 2 as susceptible to liquefaction (Hs);

- b. improved delineation of Holocene units susceptible to liquefaction in areas mapped as Qs on Plate 2;
- c. delineation and correlation of shear wave velocity and standard penetration borehole data with alluvial units in areas mapped as Qs on Plate 2; and
- d. mapping of perched ground water conditions.

Responsible Agency: Public Works.

Action 37.2

Support research on the identification of buried thrust faults and other variables affecting ground response similar to the California Institute of Technology (CalTech) Basin Geometry and 3-Dimensional Attenuation programs.

Responsible Agencies: Chief Administrative Office, Public Works.

Action 37.3

Support detailed County-wide mapping of critical and potentially hazardous facilities at an appropriate scale (possibly 1:24,000) and establishment of a standardized County computer information management system to facilitate interdepartmental and interagency data acquisition and management. Priority should be given to unincorporated County areas; and evaluation of the age and type of construction, occupancy, and other relevant data related to risk assessment, hazard abatement and emergency response operations. The following facilities should be emphasized:

1. Critical Facilities

- a. Any lifeline system facility under County jurisdiction such as energy transmission systems, major utility lines, evacuation and disaster routes, and structures storing heavy rescue and debris cleanup equipment. Accurate mapping of major energy pipelines should have a very high priority
- b. Essential facilities that are needed in times of emergencies such as hospitals, medical facilities, fire and police stations, emergency operation centers, and major communication centers.
- c. High-risk facilities that, if severely damaged, could cause catastrophic disasters far beyond the facility itself such as nuclear power plants, dams, and industrial plants which manufacture or store explosives, toxic materials or petroleum products.

- d. High occupancy facilities having potential for catastrophic fatalities and crowd control problems such as major public and private facilities used for assembly of large numbers of people, high-rise buildings; and large multifamily residential complexes (greater than 500 person capacity).
- e. Dependent care facilities, that house populations with reduced mobility, such as educational facilities for preschool and public and private schools, prisons, and major social care facilities, including group care and elderly care facilities.
- f. Economic facilities whose continued operation is paramount to avoiding severe economic impact such as banking, vital record keeping and archiving activities, computing and data processing centers, port and airport facilities, and large industrial/commercial complexes.

2. Potentially Hazardous Structures

- a. Unreinforced masonry (URM) buildings, including those with URM wall infilling.
- b. Nonductile concrete frame buildings.
- c. Inadequately designed pre-cast tilt-up construction.
- d. Multistory buildings with soft stories.
- e. Inadequately designed structures with geometrical irregularities including long spans and irregular shapes.
- f. Mobile homes and residences not properly secured to their foundations.
- g. Dilapidated buildings.
- h. Buildings with unusual interior and exterior nonstructural hazards.
- i. Potentially hazardous bridges, overpasses and tunnels.
- j. Potentially hazardous dams and water tanks.

Responsible Agencies: Chief Administrative Office, Public Works, Sheriff, Forester and Fire Warden, Internal Services, Regional Planning.

Action 37.4

Consider the development of a computerized safety information system that allows various agencies to share emergency response data. Encourage development of computer compatibility with city, State, and Federal safety information systems.

Responsible Agencies: Sheriff, Forester and Fire Warden, Public Works, Public Social Services, Regional Planning, Health Services.

Action 37.5

Support strong ground motion and microzonation mapping in cooperation with interested local, State, and Federal agencies including production of:

- a. earthquake scenarios with maps of appropriate scale using statistically probable future earthquake locations (probabilistically determined); and
- b. potential building damage maps for different structures, facilities and construction types, based on the annual probability of occurrence of maximum probable shaking from both near field (close) and far field (distant) earthquake sources.

Responsible Agencies: Public Works, Chief Administrative Office.

Action 37.6

Consider development of a computerized mapping program at an appropriate scale for Programs 37.1 through 37.4; and improve cataloging and access to seismic and geologic information by establishing, within an appropriate department, a central repository of data from the following sources to update the County's information base:

- a. investigations within Alquist-Priolo Special Studies Zones and involving other active faults as shown on Plate 1.
- b. geologic and soils reports; and
- c. private geotechnical engineering project reports and private, State and Federal shallow ground water/hazardous material monitoring programs.

Consider establishment of a technical advisory committee made up of representatives of public agencies, private geological consulting firms and other appropriate persons to evaluate the information base and recommend its improvement.

Responsible Agencies: Public Works, Regional Planning, Chief Administrative Office, Internal Services.

Action 37.7

Continue to support the instrumentation of buildings for strong ground motion measurements. Develop a program for the maintenance of new and existing instruments by building owners, and providing for annual submission of strong motion measurements to appropriate agencies.

Responsible Agencies: Public Works, Internal Services.

Program 38 - Early Warning and Hazard Forecasting

Action 38.1

Support the upgrading and expansion of real time seismic monitoring systems in Los Angeles County to include:

- a. urging the U.S. Geological Survey to install increased geophysical instrumentation for monitoring seismic activity, and conducting early warning and earthquake forecasting operations;
- b. improved procedures for issuing warnings and alerts; and activating emergency response and countermeasure operations in the event of an earthquake forecast; and
- c. applications of research to early warning and seismically triggered, automated alert systems in critical facilities.

Responsible Agencies: Chief Administrative Office, Sheriff.

Action 38.2

Explore the feasibility of a multijurisdictional funded program, in cooperation with the National Oceanic and Atmospheric Administration, to develop a Tsunami Hazards Reduction Utilizing Systems Technology (THRUST) for real time warning of locally generated tsunamis. Continue to coordinate with the Alaska Tsunami Warning Center for improved warning times for distantly generated tsunamis.

Responsible Agencies: Chief Administrative Office, Public Works, Beaches and Harbors.

E. SAFETY ELEMENT GLOSSARY

GLOSSARY

This glossary is included for the convenience of Safety Element users. Additional terms are defined in the glossary contained in the background report for the Element.

Abatement - The reduction or elimination of a hazardous condition, including but not limited to, strengthening, occupancy restrictions, or demolition.

Active Fault - A fault that shows evidence of, or is suspected of, having experienced surface displacement within the last 11,000 years. An active fault is considered to have the highest potential for future surface rupture.

Alluvium - Unconsolidated surficial sediments of clays, silts, sands, and/or gravels deposited principally by running water.

California Environmental Quality Act (CEQA) - A law requiring the consideration of environmental issues and impact analysis prior to project approval.

Critical Facilities - Structures and facilities which house essential services, are occupied by large numbers of people, or (and) which would otherwise pose an extraordinary hazard to public safety and welfare if damaged by an earthquake or other disaster. As defined by the Safety Element they include lifeline system facilities (e.g., major utility facilities, evacuation routes); essential facilities (fire and law enforcement); high-risk facilities (containing flammable, explosive, or toxic materials); dependent care facilities (hospitals, convalescent homes); high occupancy buildings (multistory structures, auditoriums); and selected economic facilities (port/airport facilities and major banking facilities).

Countermeasure Planning - Planning of emergency response, preparedness, and mitigation activities directed against the potential consequences of a disaster.

Discretionary Project - Any project that is considered as discretionary pursuant to Section 15357 of Title 14 of the California Code of Regulation.

Dynamic Analysis - A complex engineering analysis of the stability of a site or structure that considers the effect of motion from any source, such as machinery or a seismic event, on a mass.

Earthquake-Hazardous (High Earthquake Hazard) Area - An area subject to potential severe ground shaking, liquefaction, or fault rupture. This includes active fault zones (see Plate 1) and liquefaction (L) areas shown on Plate 4.

Factor of Safety - The ratio of driving force versus resisting force used to describe slope stability.

Far Field Earthquake - An earthquake with an epicenter approximately 50 kilometers or farther from a measurement site and which commonly has more significant effects on larger, multistory buildings.

Fuel Load Management - Reduction of the volume of combustible material, usually vegetation.

Ground Failure - Loss of bearing strength or movement of the ground surface from ground shaking. Ground failure can be caused by, but not limited to, differential settlement, liquefaction, or slope failure.

Hazardous Materials - Flammable, explosive, radioactive, infectious and toxic materials.

High-Risk Inundation Areas - Any area determined to be susceptible to risk of flooding from tsunami, inundation due to failure of dams and debris basins, or inundation from other sources of large volumes of water. High-risk dam inundation areas are areas subject to flooding due to failure of dams or water storage tanks with substandard design features.

Landslide Prone Areas - Areas subject to slope instability identified on landslide inventories, available maps, or as identified during geologic investigation.

Liquefaction - Loss of soil strength, caused by the temporary transformation of a soil (unconsolidated alluvium) from a wet solid mass to a weaker state that is unable to support structures, where the material behaves similar to a dense liquid as a consequence of earthquake shaking.

Long-Term - Measured in months to years after a disaster, involving mitigation of social and economic impacts.

Major Utility Facilities - Any major facility of a public or municipal utility that is vital to the continued utility service to county residents. A pipeline or sewer line over 36 inches in diameter may be considered a "major utility facility". A public utility facility will not be considered a "major utility facility" if changes to or control of a project affecting the facility by the County would be preempted by the jurisdiction of the California Public Utilities Commission.

Microzonation - The detailed mapping of various seismic hazards for use in urban and disaster response planning, including the effect of ground motion on man-made structures.

Mud or Debris Flow - The rapid downward movement of predominately saturated, unconsolidated, mud or earth, commonly including boulders and trees.

Near Field Earthquake - Used to describe the effects of a local earthquake within tens of kilometers of the source area. A near field earthquake is characterized by high frequency ground motion that is destructive to above ground utilities and short period structures.

NEHRP - National Earthquake Hazards Reduction Program.

Open Space - An area dedicated to low intensity land uses often undeveloped with structures.

Potentially Active Fault - A fault showing evidence of movement within the last 11,000 to 750,000 years.

Probabilistic - Analysis that considers the probability of a particular hazard occurring at a particular location, expressed in percent per year.

Project - Development proposals including public works projects; and applications for development such as zone changes, variances, conditional use permits, tentative parcel maps, tentative tract maps and plan amendments.

Pseudostatic Analysis - A simplified engineering analysis of the stability of a site or structure that translates motion into a static force in performing stability calculations.

Scenario - An outline or synopsis of a hypothesized chain of events.

Seismic-Geologic or Hazardous Area Overlay Zone: A zone used to implement certain measures or regulations to protect public safety within hazard areas either as defined on a particular hazard plate or a composite of hazard areas shown on two or more plates referred to in the Technical Appendix of the Safety Element.

Short-Term - Measured from the occurrence of a disaster to weeks or months later, involving activities ranging from rescue and emergency sheltering to initial reconstruction.

Soft-Story Construction - A structure with at least one story, often the ground floor, with significantly less resistance to strong earthquake shaking than other floors in the structure.

